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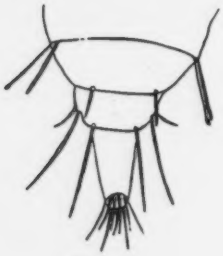
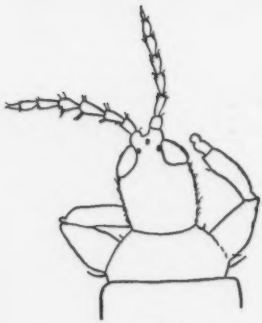


Fig. 1



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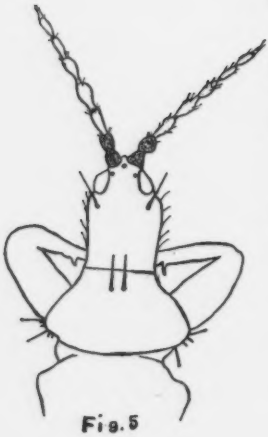

Fig. 5

Fig. 7.

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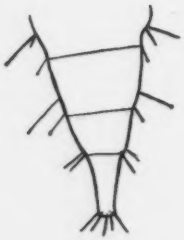

Fig. 6.

Fig. 4

NEW THYSANOPTERA FROM FLORIDA—WATSON.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXIV. APRIL, 1913. No. 4.

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New Thysanoptera from Florida.

By J. R. WATSON, University of Florida Exper. Sta., Gainesville, Fla.

(Plate VI)

Cryptothrips floridensis, new species. (Plate VI, Figs. 1-4.)

Measurements: Head, length 0.25 mm., width 0.20 mm.; prothorax, length 0.17 mm., width 0.34 mm.; mesothorax, width 0.40 mm.; abdomen, width 0.44 mm.; total length of insect, exclusive of antennae, 1.89 mm.; tube, length 0.14 mm., width at base 0.075 mm.; antennae; 1, 36 μ; 2, 51.7 μ; 3, 77.6 μ; 4, 78 μ; 5, 65 μ; 6, 63 μ; 7, 54.5 μ; 8, 40 μ; total 0.42 mm.

General color, black, no purple pigment; tarsi dark brown and antennae yellow.

Head, cylindrical, one and one-fourth times as long as wide; sides almost straight and parallel.

Eyes somewhat triangular, 9x6 μ, reddish brown, not pilose, about 250 facets.

Ocelli present, concolorous with the eyes to which the posterior ones are closely applied.

Mouth-cone, rather bluntly rounding, reaching three-fourths of the way across the pronotum.

Antennae with eight segments, one and two-thirds times as long as the head; segments one and two black, concolorous with the head, segments three to six clear yellow, eighth and tip of seventh yellowish-brown.

Prothorax short, a little shorter than the width of the head, triangular, narrow in front, well-developed spines on posterior angles and two on the anterior part of each lateral margin.

Mesothorax wider than the prothorax and very short, sides almost straight.

Pterothorax a little narrower than the abdomen, sides almost straight.

Legs long, concolorous with the body except the brown tarsi.

Wings: Fore-wings reaching almost to the end of the abdomen, fringed wth hairs which are nearly as long as the width of the abdomen, doubled for from 15 to 19 hairs, nerve weak and short, constriction rather slight.

Abdomen usually long and slender, usually widest at the second or third segment and tapering gradually to the seventh from which it rounds off more abruptly. A pair of bluntly-tipped hairs along the margin of each segment, becoming longer and arising from nearer the posterior angle on the posterior segments. The tube is 0.14 mm. long and about 0.075 mm. wide at the base. The end bears a circle of stiff hairs, eight of which are about two-thirds as long as the tube, six are shorter and weaker.

Males are similar but smaller.

Larvae: The very young are a uniform yellow in color; later they are straw-colored with numerous irregularly-shaped orange pigment masses, giving an orange color to the body, which is much wider in proportion to the length than is the case with the adult. The legs are dark brown. The antennae are at first purplish, turning to dark brown and later almost black. There are two dark areas on the head and two larger ones on the thorax.

Eggs 0.35 x 0.14 mm., black in color, surface reticulated in appearance, due to the fact that the wall is composed of hexagonal plates. They are placed in crevices in the bark of the host.

Described from fifty adults and numerous larvæ and eggs.

Found at Satsuma, Fla., in November and December by W. O. Richtman on camphor (*Cinnamon camphor*) seedlings. They were reported as quite numerous on the twigs and doing considerable damage.

Type in the collection of the Florida Agricultural Experiment Station. Cotypes sent to the U. S. National Museum.

Close to *C. californicus* Daniel, from which it differs chiefly in general color, color of the legs, color and length of the segments in part of the antennae and in its habitat.

Phloeothrips floridensis, new species. (Plate VI, Figs. 5, 6 and 7.)

Female. Total length 2.5 mm. Head 0.26 mm. long and 0.2 mm. wide; prothorax 0.2 mm. long and 0.38 mm. wide; mesothorax 0.18 mm. long by 0.395 mm. wide; metathorax 0.23 mm. long and same width as the mesothorax; abdomen about the width of the thorax; tube 0.16 mm. long and 0.05 mm. wide at its base; antennae, total length 0.46 mm., segments, 1, 30.2 x 41.5 μ; 2, 52.8 x 30.2 μ; 3, 71.7 x 37.7 μ; 4, 83x36 μ; 5, 75.5x28 μ; 6, 64x23 μ; 7. 56.6x21 μ; 8, 26.4x13 μ.

General color, dark brown under the lens, black to the naked eye.

Head, rounded in front, sides slightly converging posteriorly, the warts small and completely covering the surface, spines short.

Eyes, size 0.1x0.05 mm., oval in shape.

Ocelli large, placed well forward, posterior ones barely touching margins of the eyes.

Mouth-cone comparatively short, reaching only about two-thirds of the distance across the prothorax.

Antennae with eight segments, total length 0.46 mm. Basal two segments dark brown, concolorous with the head, third yellow but a little darker at the apex, fourth, fifth and sixth have the basal third yellow and the remainder light yellowish-brown, as are all of the seventh and eighth. Spines and sense-cones long and stout.

Prothorax 0.2 mm. long, 0.38 mm. wide, narrow in front, three long knobbed spines on each lateral margin.

Mesothorax and metathorax sides converging slightly posteriorly, each bearing a number of knobbed hairs.

Legs rather long, femora concolorous with the body, tibiae and tarsi yellowish brown, fore tarsi with a strong claw.

Wings. Fore wings rather short, barely reaching the sixth abdominal segment, fringed with hairs whose length is greater than the width of the abdomen. Hind wings a little shorter and with shorter hairs.

Abdomen long and narrow, first six segments of nearly equal width. Tube, sides converging only slightly posteriorly.

Male. Total length 1.36 mm. Head 0.24 mm. long and 0.19 mm. wide.

Antennae; joint 4, 70 μ long; 5, 63 μ; 8, 30 μ.

Front femora thicker and lighter in color than in the female and with a short, thick spine on the inner distal corner.

Abdomen markedly smaller and exceeded by the wings.

Otherwise like the female except that some other measurements are slightly less.

Larvae. Body mostly of an orange color. Anterior part of head, antennae, legs, and tube of a very light brown color. The antennae especially have a purplish tinge. Eyes small and red in reflected light. Tube relatively long and ending in two long hairs which are nearly twice its length.

Described from two males and one female. Taken from under loose bark on orange trees in the greenhouse of the Florida Experiment Station. They were found in connection with a fungus on which they were evidently feeding, January, 1913.

Types in the collection of the Florida Agricultural Experiment Sta.

Leptothrips aspersus macro-ocellatus, n. sub. sp.

On orange leaves at Gainesville, Fla., in January, 1913, there were collected numerous specimens of a thrips, that for the most part, especially in its measurements, closely agrees with the description of *Leptothrips aspersus* Hinds, but differs in some respects and especially in the very large posterior ocelli and in having strong spines on the thorax. The ocelli measure nearly 23 μ in length, and nearly as wide.

There is considerable variation in the number of hairs on the doubled portion of the lateral fringe of the fore wings. The number in some fifty specimens examined varies from none at all to seventeen in one wing examined. From five to seven is the usual number, although quite a number had three. There is also considerable variation in the amount of constriction of the fore wings; in some, none could be detected.

I do not find any description of the young of this species. Mine are of a rich red color. The tube, preceding abdominal segment, and legs, are brownish red. The head, first joint of the antennae, and apical half of the second are yellow, the head having orange blotches. The remainder of the antennae is purplish black by reflected light, and brown by transmitted light, as are also the legs.

Everes comyntas and amyntula (Lepid.).

By G. T. BETHUNE-BAKER, Edgbaston, Birmingham, England.

(Continued from page 103.)

Everes amyntula. Boisd.

Everes amyntula Scudder, Syst. Rev. Peabody Ac. Sc., p. 56 (1872); Buff. Bull. iii, p. 114 (1876). Beth.-Bak., Can. Ent., p. 96 (1910). Dyar, List. Bull. U. S. N. M., p. 45 (1902). Chapman, Trans. Ent. Soc. Lond., p. 374 (1908). Tutt. Brit. Butt. iii, p. 74 (1909).

Lycaena amyntula Boisduval, Ann. Soc. Ent. France, II, p. 294 (1852). Morris, Syn. Lep. N. Am., p. 87 (1862). Strecker, Lep. Rhop. et Heter., pt. vii, p. 82 (1874); Butts, N. A. Syn. Cat., p. 92 (1878). Edwards, Cat. Diurn. Lep., p. 64 (1884). Morrison, Papilio, iii, 9. Wright, Papilio, iii, p. 119 (1883); Papilio, iv, p. 126 (1834). Holland, Butt. Book, p. 268 (1898). Skinner, Syn. Cat., p. 59 (1898). Coquillett, Journ. N. Y. Ent. Soc. VII, p. 211 (1899). Wright, Butt. W. Coast, p. 228, f. 385b, &c. (1905). Fletcher, Can. Ent., xxvii, p. 315 (1895). Wolley-Dod. Can. Ent. xxxiii, p. 167 (1901). Elrod, Butts. Montana, p. 139 (1906).

Var. *herri* Grinnell, Can. Ent. xxxiii, p. 192 (1901). Dyar, List., p. 45 (1902).

Plebeius amyntula Kirby, Syn. Cat. Diurn., p. 356 (1871).

Unlike *comyntas*, this species differs considerably in size from different localities. The largest forms I know of are the Campo (South California) race, where the males average 32 to 34 mm., whilst the females are rather smaller. I have a good series from San Diego, where they are as a race rather smaller. The Utah specimens (Spalding) are decidedly smaller. The smallest race appears to come from Aweme (Manitoba) sent me by Mr. Criddle; they average 24 mm., the only female being slightly larger; those from High River (Alta) are rather larger, from Calgary somewhat larger still, from Winnipeg again still slightly larger, the largest Canadian forms being from Quamichan Lake, Vancouver, which are about the same size as those from Utah.

It is most interesting to find that this species is evidently in a period of active evolution and appears to be in process of setting up local forms. The Campo race is less bright in its blue color, whilst it has a uniform blue female with broad brown borders and with a marginal spotted row in the secondaries.

I have a large series especially of females. There is a tendency in the males also to develop the marginal spotted row, though it is much less prominent than in the other sex; this is also noticeable in Portola specimens. There is no special feature in the under side that is not applicable elsewhere. The San Diego males are decidedly deeper in tone of color. I have only three females from this locality, which are similar though perhaps brighter than the Campo form. The Utah race is certainly brighter in its blue than either of the Californians, whilst the females are also decidedly brighter, but the blue suffusion is smaller in area and the ground color is much blacker; on the under side also there is a difference, the spotting is less distinct, with perhaps rather more obsolescence. With one exception there is little difference in the upper side color in Canadian male specimens; the females are, however, dimorphic, viz., brown and suffused with blue. Those from Manitoba that I possess have a limited suffusion of bright blue, the ground color being almost black. I have four largish specimens from Fort W——, Winnipeg (I have been quite unable to obtain the name of Fort W——), which are blackish brown with a very slight and spare suffusion of dark blue scales only visible in a good light. Calgary specimens are similar, but the brown is less dark, whilst from Quamichan Lake, Vancouver, I have entirely brown females, also some with a very slight suffusion of dark blue scales. The under side of all these specimens differs slightly from those obtaining in the States; in all the spots are greatly reduced in size, and in a considerable number the spots in the secondaries are almost obsolete, in some quite obsolete. The obsoletion begins, as in *comyntas,* with the spot below the second costal spot, and with the fourth of the curved row, but it goes beyond this also, for on the other side of the Rockies and in Vancouver the prevalent form seems to be that with more or less spotless under side so far as the secondaries are concerned.

The one exception as to upper side color that I have already referred to calls for remark in more ways than one. Criddle's specimens from Aweme, Manitoba, are those in question; they are similar to the European *coretas* in color, that is, they

are slightly paler and perhaps clearer in tone of color than the usual form; they are also the smallest form I know, being, with a few exceptions, smaller than our *polisperchon*, the spots below are visible but quite minute in some, whilst in others the black has disappeared, leaving only the white behind; there is also a peculiar snowy hoariness over the whole under side. There is, of course, this tendency with all forms of this species, but it is specially prominent in this small form. Perhaps the most interesting point of all is the fact that I have two specimens that agree exactly in the color of the upper side with *decolorata* Stgr., this species being of a peculiar grayish blue —almost as much gray as blue—a form that obtains in Hungary and the Balkans and is distinct from *coretas* and *argiades*. Staudinger also records it from Ferghana (Eastern Turkestan) under the name *decolor*. He describes both as "viridi-coeruleus." I have only been able to make one preparation of the genitalia of the latter, but this inclines me to believe that they are the same species. My late friend (Dr. Staudinger) thought that the wide divergency of habitat with no connecting link between must involve a specific difference. I think, however, that this is not the case and that *decolorata* should sink to *decolor* Stgr. These specimens again confirm my view that, as with *comyntas* so with *amyntula*, we have a development of *coretas*, not of *argiades*, *decolor* being a good species but nearer the former than the latter. The under side of these two special specimens is similar to the others from Aweme. The Calgary form has been said to be very specialized; I cannot, however, find where that is so. It is true I have but a dozen from that locality, but I cannot specialize these either from outward appearance or by the genitalia. I also have a dozen specimens from the High River, Alberta, which are quite similar to my Calgary ones.

All my correspondents unite in saying that this species is generally single-brooded, the reason probably being that the larvae feed on *Astragalus crotalariae*, so that, if they only eat the seeds, it is evident that there can be but one brood annually. This would also apply if during the early stages they

fed on the tender leaves or flowers but required the seeds in the later stadia. This is the method that obtains with *argiades* and certain others of the Lycaenidae, and it is quite possible to be the habit in more northern localities, where it is not an uncommon species. I am not forgetful of Mr. W. G. Wright's most interesting account of the larvae of this species (Papilio, IV, p. 126). The description of the newly-hatched larva, piercing immediately into the seed pod and then, after a short time, sealing up its entrance and making it water-tight, is of the greatest interest and no doubt applies generally to the Californian race. He speaks, however, definitely of a later brood hibernating probably as larvae. (This would agree with the habits of our European *argiades*.) Unfortunately I cannot make out whether there is a real second brood or not, as no dates at all are given. In Canada the general consensus of opinion is quite definite that there is but one brood, though of course it is possible in the more favored climatic conditions of California that there may be a second brood, or at least a partial one. Mr. Wright also definitely states that the larvae are not myrmecophilous and that they actually seemed to shrink from the touch of the ant's antennae. Here we have also a close similarity of habit to our *argiades* as, though Chapman notes a honey gland, I have been unable to trace any record of their association with those insects.

Turning now to the genitalia we find the highest development in the Californian specimens and this has taken place irrespective of size. I took several from San Diego and matched them in size with others from Utah, Calgary and Vancouver, all of which are figured. It will at once be seen that the Californian example has much the largest prehensores, and this obtains generally. Those from Utah are next in dimensions (though much smaller than the San Diego race), but they are run very close by those from Vancouver, whilst the Calgary specimens are well the smallest, and this with insects practically of the same size.

In the Californian specimens the clasps are very large, with very long hook-like extremities, the apices of which are shagreened very roughly and some way down from the apex itself. This shagreening

or spiculation is finer and less extensive in *argiades,* the hooks have no sharp curve and are fine, the lower soft spatulate extremity is longer and narrower than in the European insect, and is also very finely and closely spiculed with an abundant supply of very fine shortish hairs; the clasp itself is long and broad, being of a fairly even oblong shape; the fulcrum (or penis guide) is proportionately longer so as to reach up to the top edge of the clasp. The tegumen has the central projection hollowed so as to form a sharpish tooth and is shouldered (not well shown in figure), not sloping evenly off as does *argiades,* whilst the falces (the short spikes, generally hooks, just below the tegumen) are quite fine, in marked contrast to those of *argiades.* The aedoeagus is also of the *coretas* shape, viz., tapering from a broad base not nearly even in width, as in figure 1.

Comparing this with the Utah figure it will be noticed how still finer are the extremities of the clasps, going yet further away from *argiades,* but when it is compared with the Vancouver figure a difference will be seen. The hook-like extremities are shortened in the latter; they are of the same shape and curve as *amyntula* and our European *coretas,* but not so long; in this there is a slight approach to *argiades.* This also applies to the specimen figured from Calgary, but not to the same extent. The small specimens from Aweme, Manitoba, have appendages that are essentially of the *coretas* type in all particulars. We therefore have in North America an interesting position in the evolution of species. *Argiades* does not remain, but it has apparently left some trace behind in the Vancouver race with its shorter hook-like extremities in the clasps, though in no other particular; the Manitoba specimens are *coretas* so far as their genitalia are concerned, though they could at once be separated by their color and pattern. The Calgary examples, though with shorter hook-like extremities than is the case in the Utah and Californian insects, are certainly *coretas* and not *argiades.* This also applies to specimens from Victoria, B. C., whilst the Southern examples have developed their prehensores far away along the *coretas* line and quite apart from the European *argiades.* The position is full of interest and will need further investigation later on.

We now come to the relationship of *comyntas* to *amyntula.* It has been shown from the genitalia (of which I give three figures—one from Jamesburg, Middlesex, one from Michigan and one from New Mexico) that *comyntas* is distinct from *coretas,* though allied to it. The falces of the tegumen are quite different, in their fine hooked extremities, to the straight, small spike of *coretas* (this is well seen in the figure of the Jamesburg specimen), whilst of course the insect itself is very different in general appearance. The genitalia of the Michi-

gan insect agree with those from Jamesburg, but those from New Mexico, of which I have a very long series and which are certainly *comyntas,* approach in the length of the hooklike extremities of the clasps the Californian examples of *amyntula* and also in the straight spike-like falces of the tegumen. We thus have a somewhat similar evolution of the genitalia going on with *comyntas,* as I have shown to be the case with *amyntula,* both species being full of interest from this point of view.

From the facts of their life-history and their distribution, as also from the fact of their flying together in the Mount Shasta district, together with the differences in the genitalia, I cannot conclude otherwise than that the two species are distinct from each other and that, as already stated, they are nearest to *coretas* and not to *argiades. Amyntula* does not appear to have extended its range far to the East and in this respect differs from its more dominant ally, *comyntas,* which has spread itself right across the American continent into California. Manitoba and the western side of Lake Superior appear to be its eastern limit, at least I can trace no record further east. The localities other than those already named are: Stoney Mountain near Winnipeg (Wallis); High River, Alberta (Williams); Lake Kootenay, Sicamus, Penticton, Ashnota, B. C. (all Mrs. Nicholl); Vancouver (Day); Victoria, B. C., California, widely distributed; Utah (common); Colorado, Western Montana, Arizona, Nevada.

It is not unlikely that some records may have escaped my notice, but it will be seen that *amyntula* has a much more limited range than *comyntas,* especially so east to west. Three local races of *amyntula* have been described, viz., *monica* from Southern California, *tijua* Reakirt, and also *herrii* Grinnell. Mr. Grinnell, with whom I have had the pleasure of a short correspondence, is evidently a very keen observer, but I think if he had had the advantage of having the type of *amyntula* before him that he would not have described the form. My friend, Mr. Oberthür, has kindly lent me his type of this species and I have it now before me, so that I can compare it accurately with the description of the variety. The differences

relied on by Mr. Grinnell are the width of the border, the extra heaviness of the under side pattern, the possession of only two red crescents instead of five, and the size together with the tails. Now in the type specimen the width of the border in the male is a full half millimeter, and the type itself possesses but two red crescents. In the specimens before me the heaviness of the under side pattern differs extraordinarily, as does also the number of red crescents, and as I have already said, I have females with quite narrow black borders to their wings. The only point that I can find is that the four specimens from which the description was taken (obtained at Cochise County, Arizona) were smaller than usual. Except for this I could match the description from several other localities. I have passed through the "lumping stage" long ago and am perhaps given to split finely at times, but I do not think I should have risked describing this on the slender and exceedingly variable differences relied on by the author. They are, I think, insufficient for an aberration.

Everes monica Reakirt and **tijua** Reakirt.

Everes monica. Dyar. List. Bull. U. S. N. M., p. 45 (1902). Tutt, Brit. Butt., iii, p. 75 (1909).

Lycaena monica Reakirt, Proc. Ac. Nat. Sc., Phil., p. 244 (1866). Strecker, Lep. Rhop. and Het., p. 82, pl. 10, f. 18 (1874); Cat. Macro. N. Am., p. 91 (1878). Edwards, Cat. Butt. N. Am., p. 65 (1884). Skinner, N. Am. Rhop., p. 59 (1898). Strecker, Lep. Rhop. Het. Suppl., p. 20 (1900). Wright, Butts. West Coast, p. 230 (1905).

Everes tijua Tutt., Brit. Butt. iii, p. 75 (1909).

Lycaena tijua Reakirt, Proc. Ac. N. Sc., Phil., p. 244 (1866). Wright, Butt. W. Coast, p. 230 (1905).

These are, I believe, generally accepted now as being synonyms and it appears to me that W. G. Wright is correct in separating them from this group—he places them between *arizonensis* and *isola.* The insect is described as having three transverse lines of spots between the cell and the termen in each of the wings, and they are stated to be rows of well-defined spots; this would separate it from *comyntas* or *amyntula.* It does not appear to have been taken again since it was described in 1866, though my friend, Mr. W. P. Comstock, tells

me he has a specimen from San Diego, California, answering well to the description and figure. Mr. Wright states that he has not much faith in it. It is unsatisfactory to leave it thus, and if the type could be obtained for one of the big American museums a good service would be done thereby.

EXPLANATION OF PLATE V. (Published in the March Issue).

Male genitalia of species of *Everes*.

Fig. 1. *Everes argiades*, profile view.

Fig. 2. *E. coretas*, profile view.

Figs. 3-5. *E. comyntas*, profile view: 3, Michigan; 4, Fort Wingate, New Mexico, note the extreme size, also development of clasps; 5, Jamesburg, N. Jersey, semi-vertical view.

Figs. 6-10. *E. amyntula*, profile view: 6, Utah; 7, San Diego, California (note the large size of the genital organs); 8, Calgary, clasps profile, tegumen half turned around showing vertically; 9, Aweme, Manitoba, semi-vertical view; 10, Vancouver, profile view (note the somewhat stouter hooks to the clasp, being in this respect midway between *argiades* and *coretas*.

Fragments from an Entomological Diary, Texas, 1904.—Appearance of Insects in Spring.

By A. A. GIRAULT, Nelson (Cairns), North Queensland, Australia.

At Sherman, Texas, January 29, insects were dormant, excepting a few flies. At Houston, on the following day, though warm and springlike and farther south, the same conditions prevailed, a few flies only on the wing and active; a cluster of wasps found hibernating under the loose bark of a dead tree stump; they could walk but were unable to fly; they were *Polistes*. At Corpus Christi, February first and second, however, insects were active—a *Diabrotica* (12-*punctata*) was feeding upon truck crops, an acridid was flying about in a cabbage patch; moths and butterflies were seen; yet the general insect population was hibernating. On February 7, at Victoria, additional species of butterflies were observed in the afternoon; *Diabrotica* 12-*punctata* was active, but *Megilla maculata* was hibernating in colonies under the bark of trees. At Cor-

sicana, February 9, hibernation prevailed. So at Paris, February 12 but on February 15 a butterfly was observed on the wing; on the twenty-third, flies were active, also bees and a general movement from hibernation commenced; moths, obviously freshly emerged, were noted about the lights of the city at night. Butterflies were also flying. On the twenty-fifth, *Polistes* on the wing; also butterflies, jassids, acridids; *Megilla maculata* still hibernating; ants swarming; *Anasa* hibernating. Three days later, cicindelids were observed to be active and a *Chilocorus;* on March 1, cerambycids, chrysopids and cercopids were noted; by the following day, fruit trees were in bloom generally and insects now much more noticeable; psyllids were emerging from their galls, chalcids, libellulids, papilionids on the wing, insects numerous at lights at night.

On March 3, it was much colder and fires felt comfortable; insects very scarce and for several days afterward, the cold continuing. It was warmer again by the seventh and insects reappeared. *Malacosoma* hatching; *Lachnosterna* and *Passalus* recently emerged; *Diabrotica* noticed for first time here, also tipulids. The maximum temperature on the tenth was 71 deg. Fahr.; on the eleventh, maximum 76 deg., minimum, 46 deg. The twelfth was markedly warmer, the maximum reaching 89 deg., the minimum only 53 deg.; insects were noticeably more abundant than formerly, but on the thirteenth it cooled and again there was a marked decrease in the active insects seen. By saying it cooled, it should not be understood that the maximum temperature was much lower; it registered on the thirteenth 86 deg., the minimum 47; but the morning was much cooler and this had the effect of keeping insects inactive. The rest of the month the highest temperature ranged from 52 to 84 deg., the minimum from 30 to 69. By the seventeenth, the *Megilla* was active and the eggs of insects commenced to hatch. On March 26, it was again much cooler, and insects again noticeably much less active; on the 29th there were high southerly winds, which had the same effect as the cold but when it became markedly warmer the next day, though the wind continued, insect activity was heightened.

These general observations show how gradual is the commencement of activity in insects after hibernation, how each kind becomes active in its own time, and how even within a small amount of latitude there is a wide difference in times of appearance for each species. The effect of cold spells on insect activity is also shown. In Texas, the mean temperature is above 43 deg. Fahr. during the winter.

In Texas, in 1904, the following specific observations were noted; *Diabrotica 12-punctata* was active at Corpus Christi on February 1, at Paris not until March 7. *D. vittata* was not seen at Paris until March 17. Mosquitoes were first observed at Paris on March 12, but did not become noticeable until April 25; (according to Mr. G. H. Searles of Paris they were very numerous and annoying at Houston on March 20). *Leptinotarsa 10-lineata* was not observed at Paris until March 23, its larvæ not until May. A hemipteron which I identified as *Blissus leucopterus,* the common chinch-bug of cereals, was noted several times—once hibernating (Feb. 27) in rubbish, edge of road near woods and under a stump standing in a cornfield (Paris), and a second time captured from grass at Paris on March 24; it was noted to be active the previous day. A species of *Gryllus* did not become adult until April 13, though insect activity had long since commenced. *Megilla maculata* De Geer was found hibernating at Paris on February 25; they could move. They were not observed to be active until March 17; the mean temperature on the former date could not have been much less than eight degrees lower than at the March date.

Malacosoma americana was first observed in the eggstage at Sherman, January 29. On March 7 at Paris, the fruit trees in general bloom, the larvæ of the first stage were present and hatching was general. On March 27 at Paris, larvæ 3 cm. long were noted in orchard trees and on March 31 the larvæ were preparing to pupate, since large ones measuring 4 cm. were found wandering about by themselves. But on April 3, many small nests were found along roads leading out from

Paris, and the larvæ in them were usually small, only a few nearly full-grown. On May 7 it was noted that the larvæ had long since disappeared, and on the 11th an adult was taken in a trap lantern at Paris.

Oiketicus abbotii was taken at Corpus Christi and what appeared to be the characteristic bags of *Thyridopteryx ephemeraeformis* were found at Corsicana. *Anasa tristis* was taken hibernating under rubbish near a cotton field at Corsicana, February 9; another at Paris in open woods, February 25, and two days later under the bark of fence posts around cotton fields; it was not noted as reproducing and active until in May (Paris). On February 28, *Chilocorus bivulnerus* was taken, active, at Paris. *Papilio* was first seen on the wing at Paris on March 2, but noctuids and *Colias* had been out several weeks; *Papilio turnus*, freshly emerged, was taken on March 10, a *Vanessa* on March 12, *Thecla* and *Thanaos* on the fifteenth; *turnus* again on March 24 and 27; *Anosia plexippus* mating on March 30, its eggs on April 2 and first stage larva on April 13. *Pontia rapae* eggs on April 18, very abundant on cabbages.

Calandra granaria was found at Paris, March 14, on ears of corn which had been exposed during the winter at Hetty; they were active. *Lachnosterna* first observed on March 7 at Paris when a single specimen was found on the sidewalk; on April 6, it was noticed that they were tolerably common at lights, on April 11 numerous, and abundant on April 18. *Calasama calidum* was taken on April 18, and *scrutator*, May 4, both at light.

Change in Title.

The "Pomona College Journal of Entomology," which has been published for the past four years, is to be continued under the title of *The Journal of Entomology and Zoology*.

The Journal will publish papers on morphological, systematic, and economic subjects, with general as well as technical articles. There will be short articles, reviews, and notes of general zoological interest. Although the publication will be adapted to the needs and conditions of Southern California, its subject matter will be of interest to all zoologists and entomologists. Subscription, $1.00 a year; $1.25 to foreign countries. Published quarterly.—WILLIAM A. HILTON, Acting Editor, Pomona College, Department of Zoology, Claremont, California, U. S. A.

New Peruvian Parasites from Hemichionaspis minor (Hym.).

By E. W. Rust, Assistant Government Entomologist, Lima, Peru.

For the past year the writer has been engaged in work directed against pests of the native or tree-cotton (*Gossypium peruvianum*) in the Department of Piura, northwestern Peru. During that time many enemies of the greatly feared plague known as "piojo blanco" (*Hemichionaspis minor* Mask.) both parasitic and predaceous, have been studied and of the former group by far the majority belong to Aphelininae and Signiphorinae. Several of these forms appear to be new to science and it is for the purpose of gaining for them a definite name and place in entomological literature that this short paper is written.

Some of the descriptions are from material reared by Prof. C. H. T. Townsend, Entomologist to the Peruvian Government, to whom the writer is deeply indebted, not only for the above-mentioned specimens, but equally so for his many helpful suggestions during the prosecution of this work. The remaining descriptions are from parasites reared by the writer, the type specimens of which are to be deposited in the U. S. National Museum.

Genus **PROSPALTELLA** Ashmead, 1904.

Prospalta (=*Prospaltella*), Howard; described in "Insect Life," 1894—2 species—no type designated.

Prospalta (=*Prospaltella*), Howard; mentioned in "U. S. Tech. Ser. No. 1," 1895—2 species—no type designated.

Prospalta (=*Prospaltella*), Ashmead; mentioned in "Chalcidoidea," Jan., 1904—type designated as *murtfeldtii*.

Prospaltella, Ashmead; proposed in "Proc. Ent. Soc. Wash." 1904.

Prospaltella, Howard; mentioned in "U. S. Tech. Ser. No. 12, part 4," 1907—type designated as *aurantii*.

On studying this genus it becomes evident that the generic description was drawn up from the species *murtfeldtii*, but Dr. L. O. Howard, in his "Revision of the Aphelininae of North America" (Technical Series No. 12, Part IV, U. S. Bureau of

Entomology, pg. 79, 1907) cites *P. aurantii* as the type. However, this cannot be accepted, for W. H. Ashmead in the "Classification of the Chalcid Flies" (Memoirs of the Carnegie Museum, Vol. I, No. 4, p. 345, 1904, designated *P. murtfeldtii* as the type of the genus. Previous to this, the writer finds no mention of a type species, as the original description of the genus by Dr. Howard (Insect Life, Vol. VII, p. 6, 1894) is silent on the subject, as is also a subsequent paper (Technical Series No. 1, U. S. Bureau of Entomology, p. 39, 1895). Therefore Ashmead's designation of *murtfeldtii* as the type must hold. That such is the case is rather unfortunate, as this species is rather less typical of the genus, as now known, than is *P. aurantii*. Moreover, with the addition of the species herein proposed, a few long-needed changes in the generic description become more apparent than ever.

1. First joint of the club is *not* always the widest. In *P. peruviana* sp. nov. the second joint equals, or is greater than, the first in width.

2. In some species the body does *not* taper "gradually from tegulae to tip of abdomen." This gradual tapering may be true of the type species, *P. murtfeldtii*, but it is not the case with *P. peruviana* or specimens of *P. aurantii* collected in Peru, in which the sides of the first, or longest, segment are nearly parallel, and in *P. berlesei* How. the abdomen is actually wider in the center than at either extremity.

3. Eyes *not* always naked. The eyes of *P. peruviana* are distinctly hairy, as can be seen in fresh specimens with the 16 mm. objective, or in balsam mounts with the 4 mm. objective. The eyes of *P. quercicola* How. are also mentioned as being faintly hairy, in the description of that species (Annals Entomological Society of America, Vol. I, p. 282, 1908).

Prospaltella peruviana sp. nov.

Female.—Length, 0.75 mm.; greatest length of fore wing, 0.6 mm. Differs from *P. aurantii* How. to which it is closely related, as follows: Body slightly larger. Funicle joints 1, 2 and 3 increasing gradually and uniformly in both length and diameter. Fore-wings broader, slightly longer, not so slender and with a more pronounced outward

bend distad of stigmal vein, thus making distal half of wing broader in proportion to length than in *P. aurantii*. General color darker, being dark brownish yellow on thorax with brown abdomen; scutellum in life, pale-greenish with a suggestion of yellowish which in mounts becomes decidedly yellowish; legs honey-yellow. Fore-wings with dilute fuscous area covering disc below fuscous marginal vein.

Male.—Unknown.

Described from 2 female specimens reared by Prof. C. H. T. Townsend from *Hemichionaspis minor* Mask. on cotton, Mallares, May 25, 1910, and Macacará, Aug. 5, 1910. (both Dept. of Piura). Balsam mounts.

Type specimen on slide labeled Macacará, Aug. 5, '10.

This species has since been collected in great numbers both at Lima and all through the Department of Piura. In life its strikingly noticeable green scutellum distinguishes it at a glance from other species, although it seems to be somewhat intermediate between *P. aurantii* and *P. berlesei;* resembling the former in general wing and body characters and the latter in antennal structure, except for the short first funicle joint which alone would distinguish it from closely allied species.

Genus **SIGNIPHORA** Ashmead, 1880.

With regard to numbers, this genus is very well represented in Peru, the individuals being plentiful in various coccids, especially in *Pseudaonidia* sp. and *Hemichionaspis minor*. To date, however, only two species have been recognized, one of which is new and is described below; the other differing from the original description to such an extent, in some cases, that the following points have been noted at various times:

Signiphora occidentalis How.

Specimens of this species collected in various parts of Peru vary greatly in coloration. Some agree exactly with the original description of the species (Insect Life Vol. IV, No. 3 [1894] p. 235) while others show more yellow than the species is credited with. In the original description the head is spoken of as dark brown, but the writer has before him specimens of both sexes otherwise typical, in which the head and antennae

are almost wholly yellow, being touched with light brown only upon the vertex. Other female specimens show the pronotum with only a spot of brown near its center, the rest being lemon-yellow, and with the whole metanotum of the latter color. Some male specimens differ from the original description in having the scutellum bright lemon-yellow, all gradations between the two having been met with in Peruvian material.

The above observations were made from both balsam and dry mounts, and tend to show that the original description fixed the coloration of this species a little too closely (probably owing to the small number of specimens on which the description was based) and that the ratio of yellow to brown really varies quite widely among the different individuals of the species.

Signiphora lutea sp. nov.

Female.—Length, 0.65 mm.; greatest length of wing, 0.5 mm. exclusive of cilia. Antennal scape robust, reaching to middle of eyes; pedicel large, stout, two-thirds as long as scape, and about the same width; funicle joints 1, 2 and 3 very small, increasing slightly in diameter from 1 to 3, joint 3 being from two to three times length of joint 1 and joint 2 intermediate in length between joints 1 and 3; together they are rather less than one-third length of pedicel, and the largest is only one-half the diameter of pedicel at its thickest part; club a trifle more than twice length of pedicel, long-oval in side view and nearly twice as wide as pedicel, when seen from above it is of same width as funicle joint 3, with parallel sides. Club sparsely longitudinally striated. Marginal vein with 6 strong, prominent bristles, sub-marginal vein with one and stigmal vein with one. All wing veins fuscous; forewings with fuscous patch covering all the disc below marginal and stigmal veins. Hind wings as in *S. occidentalis.*

Middle tibiae with two external spines near base and one near tip. Head deep lemon-yellow often tinged with brown on vertex; antennae lemon-yellow at base shading through fuscous into brown at tip of club; eyes very dark-red, almost black; ocelli dark-red; mouth parts light-brown, mandibles black-tipped. Thorax lemon to canary yellow except for brown pronotum and front margin of mesonotum, three minute black dots on each side near insertion of wings. Abdomen generally slightly darker than thorax, with a varying band of brown on cephalic portion. This brown band may vary in size from wide, covering the first three abdominal segments, to linear, or even dis-

appear. Small black spot on each ovipositor-sheath near its insertion. tip of same, brown. Legs yellow.

Male.—Aside from sexual characters, resembles female except in being rather smaller, more slender and having a brown patch on each side of the median line of the penultimate abdominal segment.

Described from many male and female specimens reared during 1910-1912 in the Dept. of Piura, Peru, and at Lima, Peru, from *H. minor* and *Pseudaonidia* sp. on various hosts, principally cotton and citrus. Both dry and balsam mounts.

Type on slide labeled A, 163° 3a. Samán (Dept. Piura) 12-22-'11—Rust.

NEOSIGNIPHORA gen. nov.

Differing from *Signiphora* in that body is larger and more slender. Antennae 7-jointed, counting scape as one joint, although it is really composed of two joints, the first of which may not articulate with head but which shows a distinct suture. Scape long and moderately slender, first joint nearly one-half as long as second and a little more slender; pedicel large and robust; funicle 4-jointed and quite small; club very long and slender, undivided and with several longitudinal keels. Mandibles tridentate. Eyes naked. Sub-marginal vein of fore-wing nearly twice as long as marginal. Apical spur of middle tibiae scarcely two-thirds as long as first tarsal joint.

Type, *N. nigra*, sp. nov.

Neosigniphora nigra sp. nov.

Female.—Length, 0.8 mm.; greatest length of wing, 0.55 mm. exclusive of cilia. Antennal scape moderately slender, reaching almost to top of eyes, pedicel a little longer than first scape joint and much more robust, being of a diameter equal to half its length; funicle joints 1, 2, 3 and 4 increasing gradually in diameter, the first being very small and the fourth of nearly two-thirds the diameter of club; funicle joints 1, 2 and 3 subequal in length, joint 4 from two to three times as long as any of the other three; club very long and slender tapering to a point, as long as scape, pedicel and funicle joints together and (when seen in broad outline) two-and-one-half times as wide as scape, or a little wider than pedicel; slightly crescent-shaped. Marginal vein with 5 strong bristles, sub-marginal with two, stigmal with one. Middle femora with strong spine near tip on inner side. Middle tibiae with two spines on outside at base and one near tip.

Color: Head (except vertex) dark brown, vertex deep brownish-yellow, eyes black, ocelli dark-red; mesonotum and metanotum brownish-yellow; rest of thorax and abdomen dark brown; legs mostly whitish except for a brown cloud over the upper half of the tibiae and the lower part of the femora; wing veins fuscous; fore-wings with just a suggestion of an indefinite fuscous band in center of wing parallel to the marginal and sub-marginal veins.

Male.—Unknown.

Described from ten female specimens reared by Prof. C. H. T. Townsend from *H. minor* on cotton from Chaquira, Dept. of Piura, Peru, Aug. 9 and 10, 1910. Five slides, balsam mounts.

Type specimen, one of three on slide labeled: Chaquira Aug. 10-'10—T.

Prof. Townsend notes the following from live specimens: "Fresh specimens show the head inflated and with whole of wide front light yellow; a little of face is yellow, but broad cheeks are blackish; prothoracic scutum with silvery anterior margin, pale yellow posteriorly-directed inwardly-oblique lateral border, and two light yellow fasciae immediately behind same and separated from each other by a black hair-line, the hinder one much the wider. Rest of thorax and all of abdomen shining black."

In this genus we have what appears to be a two-jointed scape. The first joint may or may not be movable, but it is at least separated from the head by a distinct suture. The writer has noted this peculiarity in other genera, particularly in *Signiphora,* and Prof. Townsend notes it in some undescribed species from the montaña of Peru. As yet no literature has been found upon this subject which is one which should be investigated by those interested in this and allied groups of the superfamily.

Monograph of Aleocharinae. (Coleop.).

We learn through the *Pomona Journal of Entomology* that Dr. A Fenyes, of Pasadena, Cal., is monographing the Aleocharinae (Staphylinidae) for the *Genera Insectorum.*

A New Signiphora from Queensland, Australia (Hym.).

By A. A. GIRAULT, Nelson (Cairns), North Queensland, Australia.

The following new species was captured too late to be included in my monograph of the subfamily Signiphorinae, now in course of publication in the Proceedings of the United States National Museum. I also record another species new to the fauna of the continent. The new species is the twenty-eighth of the genus.

Genus **SIGNIPHORA** Ashmead.

1. **Signiphora reticulata** new species.

Normal position.

Female.—Length 0.80 mm. Moderate in size for the genus.

Black, the head and thorax dark metallic green, the wings perfectly hyaline, with no proximal fumation. Venation, legs and antennae brownish black. Proximal three tarsal joints and much of the cephalic tibia, yellow. Mesonotum and vertex, finely, transversely lined. Abdomen, the rectangular (wider than long) scutellum, the transverse mesopostscutellum and the triangular propodeum all similarly, distinctly polygonally reticulated. Discal bristle absent. Stigmal vein conical. Marginal fringes of the fore wing very short, those of the posterior wings slightly longer, the latter wings very broad, where widest full three-fourths the width of the fore wings. Antennal club conic-ovate and moderate in length.

Male.—Not known.

Described from a single female specimen mounted in balsam and captured with the sweeping net in a forest near Ayr, Q., November 6, 1912. (From 2-3-inch objective, 1-inch optic, Bausch and Lomb.).

Habitat: Australia—Ayr, Queensland.

Type: No. *Hy.* 1281, Queensland Museum, Brisbane, the foregoing specimen in xylol-balsam.

Belongs to the *nigra* group and to that section of it where the marginal fringes of the fore wing are very short. Closely allied with the Australian species *corvina* Girault (description still in MS. in the monograph mentioned) from which it differs in bearing hyaline wings, narrower fore wings and in being much

less robust. The species *funeralis* has decidedly longer marginal fringes and its wings are deeply fumated throughout.

2. **Signiphora aspidioti** Ashmead.

I have captured two specimens of this species, heretofore known from Mexico only, at Nelson (Cairns), North Queensland, Australia; a female from a window, August 3, 1912, and another specimen of the same sex in the same place, October 9, 1912. The capture was made in a township area.

3. **Signiphora australiensis** Ashmead.

A female specimen of this species was taken from a window at Proserpine, Queensland, November 2, 1912. The propodeum is delicately polygonally reticulated.

Observations on Buprestidae at Southern Pines, North Carolina (Coleop.).

By Abram Herbert Manee, Southern Pines, N. C.

Chalcophora virginiensis Drury.

In October an occasional specimen on young pines probably feeding. December to March, under pine straw at foot of large pines mostly on north side of trees. April and May, mates and oviposits on fallen or standing freshly dead pines. Quite abundant.

Chalcophora georgiana Lec.

October and November, many fresh specimens *feeding* on needles of young pines. Must hibernate, but I cannot find their haunts. From late March to June, very abundant on young pines, where they mate and feed among the needles. Probably oviposits in dead spots of living pines. More abundant than *virginiensis*.

Dicerca pugionata Germ.

Five specimens taken viii-7-'12 on black alder.

Dicerca obscura Fab.

Late March through April, abundant on trunk and limbs of persimmon; later occasionally on leaves of persimmon saplings. In autumn old dull forms on persimmon and rarely hibernates under loose bark. Fresh spring specimens have a whitish

bloom easily lost in poison jar or capsule, but which may be preserved by very dry killing and immediate mounting. Nearly all specimens are wide and dull blackish, but a rare winter form is narrow and coppery.

Dicerca spreta Gory= americana Hbst.

Late winter under loose bark of large deciduous trees. Rare.

Dicerca punctulata Sch.

In early November, very rarely among needles of young pines; in December, under pine straw or at base of living lob-lolly pines or in shaggy bark of living long leaf pines. The new sub-species *pinorum*, Casey, occurs with *punctulata* and is distinguished by connected thoracic striae, wider elytra, and coarser ventral punctures. Both forms are dull reddish brown with whitish bloom.

Buprestis rufipes Oliv.

One specimen vi-30-'05 flew to person at edge of wood. One specimen sent from ten miles west. Two right wings.

Buprestis lineata Fab.

June to late July on blasted pines, occasionally on pine logs.

Buprestis fasciata Fab.

Very rare, in lowlands July to late August.

Buprestis striata Fab.

October 27 and November 22, split out fresh imagines from pitch pine cordwood, at the latter date also some pupae and larvae; from late March to early April, among needles of young long-leaf pines, probably feeding; mid-April to early May, rather active and often above reach on denuded trunks of blasted pines where they mate and oviposit.

Buprestis decora Fab.

Larva and imagines split out of rotted pine railway ties in late October; in December, from warmth of woodbox may leave its fuel home; from mid-March to early May, among needles of young long-leaf pines, probably feeding; in May, on denuded trunks of dead and semi-decadent pines; an occasional stray specimen in June.

Note. *Striata* and *decora* remain in the wood as imagines from late October to spring, *decora* emerging about March

1st, *striata* in early April. *Striata* seeks pine in its second year of death, *decora* prefers pine more nearly rotted, *lineata* desires pine in first death year, *apricans* oviposits exclusively in cracks of dry dead spots or blazes of large *living* long leaf pines.

Buprestis apricans Hbst.

Late March to early April, among needles of young long-leaf pines, probably feeding; mid-April to mid-May, on dead blaze of big living long-leaf pines. This is the favored locality of this large and very choice borer.

Melanophila notata Lap. and Gory.

Only one specimen in six years, then on June 27, 1911, took 38 at blazing pine stump as they flew to our clothes or rested in white ashes or on nearby wood. Of these, 20 were gold-spotted, 16 were immaculate and 2 were very small, immaculate and, as I at once saw, a distinct species. F. Blanchard thought this near *opaca* and probably new. H. C. Fall thinks it near *longipes* and perhaps new. June to August, 1912, took more *notata* at burning pine and learned that natives call them "fire bugs," believing them to actually come from the fire and to contain such heat as to burn the skin should they rest upon it. It is probably drawn by the scent of burning pitch. As it alights on a black stump one would think its generic name fitting to that habit as well as to its own color, yet it as readily seeks white ashes or a white shirt. Both forms of *notata* vary in size from 7 mm. to 13 mm., but every specimen is either entirely unmarked or distinctly marked, though the marks may vary from two to full number.

Melanophila sp.?

Two specimens vi-27-'11 as mentioned above. Length 7 mm. Slightly wider and more rotund than *notata* of same length. Sculpture of thoracic and elytral bases less pronounced than in *notata*. Greatest width of thorax at first third, while in *notata* it is medial or post medial.

Melanophila carolina Blanchard MS., n. sp.

Four specimens taken among needles of young long leaf pines, two in June, 1910, one vii-18-'11, one vii-19-'11. See below.

bloom easily lost in poison jar or capsule, but which may be preserved by very dry killing and immediate mounting. Nearly all specimens are wide and dull blackish, but a rare winter form is narrow and coppery.

Dicerca spreta Gory= americana Hbst.

Late winter under loose bark of large deciduous trees. Rare.

Dicerca punctulata Sch.

In early November, very rarely among needles of young pines; in December, under pine straw or at base of living lob-lolly pines or in shaggy bark of living long leaf pines. The new sub-species *pinorum,* Casey, occurs with *punctulata* and is distinguished by connected thoracic striae, wider elytra, and coarser ventral punctures. Both forms are dull reddish brown with whitish bloom.

Buprestis rufipes Oliv.

One specimen vi-30-'05 flew to person at edge of wood. One specimen sent from ten miles west. Two right wings.

Buprestis lineata Fab.

June to late July on blasted pines, occasionally on pine logs.

Buprestis fasciata Fab.

Very rare, in lowlands July to late August.

Buprestis striata Fab.

October 27 and November 22, split out fresh imagines from pitch pine cordwood, at the latter date also some pupae and larvae; from late March to early April, among needles of young long-leaf pines, probably feeding; mid-April to early May, rather active and often above reach on denuded trunks of blasted pines where they mate and oviposit.

Buprestis decora Fab.

Larva and imagines split out of rotted pine railway ties in late October; in December, from warmth of woodbox may leave its fuel home; from mid-March to early May, among needles of young long-leaf pines, probably feeding; in May, on denuded trunks of dead and semi-decadent pines; an occasional stray specimen in June.

Note. *Striata* and *decora* remain in the wood as imagines from late October to spring, *decora* emerging about March

1st, *striata* in early April. *Striata* seeks pine in its second year of death, *decora* prefers pine more nearly rotted, *lineata* desires pine in first death year, *apricans* oviposits exclusively in cracks of dry dead spots or blazes of large *living* long leaf pines.

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Melanophila carolina Blanchard MS., n. sp.

Four specimens taken among needles of young long leaf pines, two in June, 1910, one vii-18-'11, one vii-19-'11. See below.

Anthaxia cyanella Gory.
Two specimens, May.

Anthaxia quercata Fab.
May; not uncommon on small oaks.

Anthaxia flavimana Gory.
May and June; not common on young pines.

Chrysobothris floricola Gory.
April, May, September, October; not uncommon in foliage of young long-leaf pines but very shy and active.

Chrysobothris dentipes Germ.
Late April to mid-July, common and active on fresh pine logs.

Chrysobothris pusilla Lap. & Gory.
May, June, not common in foliage of young long-leaf pines.

Chrysobothris chrysoela Ill.
Early April, on twigs of persimmon. Very rare.

Chrysobothris harrisii Hentz.
Early June, on black alder. Very rare.

Acmaeodera ornata Fab.
Late March or early April on dog-wood blossoms. Very rare.

Acmaeodera pulchella Hbst.
June, July, on blossoms of primrose and other yellow flowers. Not common.

Acmaeodera culta Web.
Late March and April, on dog-wood blossoms, later on blackberry. Very common.

Eupristocerus cogitans Web.
Late May, on black alder. Rare.

Agrilus ruficollis Fab.
Late May to late July, on blackberry. Not common.

Agrilus bilineatus Web.
Two specimens, April.

Agrilus vittaticollis Rand.
One specimen.

Agrilus granulatus Say.

One specimen on black alder.

Agrilus politus Say.

June, July, abundant on willow.

Agrilus egenus Gory.

Mid-April to mid-May, on foliage of dog-wood.

Taphrocerus gracilis Say.

Mid-May, not common on low oak bush.

Brachys ovata Web.

March to late summer, on leaves of oak. Exceedingly abundant. Lives in leaves of oak, splitting the leaf as it feeds, pupates in leaf in February and becomes imago in leaf in early March.

Brachys aerosa Melsh.

May, June, on oak. Rare.

Pachyscelus laevigatus Say.

June, not uncommon on a low thin-leaved milky weed.

DESCRIPTION OF NEW SPECIES.

Melanophila carolina Blanchard MS., n. sp.

As the late Mr. Blanchard left this manuscript name unpublished, I will attempt a description which must not interfere with Blanchard's authorship.

Length 6.3 mm., width 2.5 mm.; sub-cylindrical; face crinkly-punctate; thorax densely but not coarsely punctulate, unsculptured, very rotund at sides to near basic third where from beneath it slopes in an incurved edge to point of broad basic spur, or spear-point; upper aspect, sides rounding to basic third whence it is parallel to near point of spur; elytra densely and coarsely punctulate, broadly and deeply indented at shoulder, plump and smoothly rounding to below mid-costae, sides nearly parallel to middle whence after a slight widening they slope to the rounded tips; color, bright metallic, beneath cupreous running to dark green on ventral segments, above, head and thorax reddish cupreous, elytra olive, one specimen steel blue; male claspers with four or five fine hairs curving inwardly and backwardly.

Southern Pines, North Carolina. Four specimens as above stated; one in the Blanchard collection, one with Col. Wirt Robinson, one is owned by Dr. E. C. Van Dyke, the fourth is in the cabinet of the author.

Some Sources of Laboratory Material for Work on the Relation of Insects to Disease.*

By WILLIAM A. RILEY, Cornell University, Ithaca, New York.

The great discoveries during the past twelve or fifteen years regarding the relation of insects to disease have made it imperative that departments of entomology be prepared to give at least elementary instruction along this line. When one undertakes to outline some such work the question of securing material immediately arises.

There is comparatively little difficulty in obtaining various parasitic mites and ticks, lice and bugs, house-flies, mosquitoes, and fleas, in their different stages, and it is important that such should be available for laboratory study. Very much zest and value can be added to the work if there be available also some of the parasitic protozoa and worms which are transferred by arthropods, but there is usually the feeling that these, with the exception of the human malarial parasite, are tropical forms and beyond reach. When one investigates conditions, however, he finds that even in our Northern States there is a surprising variety of forms which may be utilized to great advantage. It is for the purpose of calling attention to some of these and getting the experience of others that I have chosen this topic.

We do not have the fly-borne germ of the nagana or of the dread sleeping sickness, but we do have the first discovered trypanosome of warm-blooded animals—the *Trypanosoma lewisi* of the brown rat. This parasite is transferred by the rat flea and louse. For practical purposes it is more valuable for laboratory study than any other of the genus, and certainly shows all the detail that would be desired. It is practically cosmopolitan in distribution and has been found in this country at least in Detroit, Lincoln, Philadelphia, Ann Arbor, Madison, San Francisco, Urbana, Baltimore and Ithaca. It may be transferred from rat to rat—white or brown—by the crudest of injections and thus kept for laboratory study. If one has

*Contribution from the Entomological Laboratory, Cornell University.

the necessary equipment for bacteriological work and the skill he may keep artificial cultures by the method first perfected by MacNeal and Novy, '03.

It should not be forgotten that the first trypanosome described and the type of the genus was found by Gruby, in 1843, in the blood of the frog. This, or a very closely related species, is not rare in frogs in this country, and on account of its comparatively enormous size is a striking object for demonstration. Other species are to be met with in the blood of fishes and reptiles.

Closely related to the Trypanosomes are certain flagellated parasites of the alimentary canal of insects. The most common of these are *Crithidia melophagia,* which is found in practically all sheep ticks, and *Herpetomonas muscae domesticae* which is very common in the house-fly. It is claimed by some that the first of these is a stage in the development of a blood parasite of the sheep. Whether that is true or not both forms are of interest as parasitic protozoa of insects.

The complicated life-cycle of the malarial parasite is not readily comprehended by a student who has had no training in protozoology and hence I find it very helpful to introduce this subject by the study of a comparatively simple sporozoon, and by the examination of some of the larger haemosporidia.

The most satisfactory and readily available form for introductory work is a species of *Monocystis* from the seminal vesicles of the earthworm. Practically every worm is infested, though the larger ones are more easily examined by beginning students. I have never failed to find during a practicum the immature trophozoites within the sperm morulae, motile trophozoites, encysted gametocytes, cysts, spores and mature sporozoites.

Of the Haemogregarinidae, one of the first discovered was *Lankesterella ranarum* (better known as *Drepanidium ranarum*), which was found by Lankester in 1872. This is fairly common in frogs at Ithaca and in those which I have had from North Carolina and from Wisconsin. While the life cycle of this species is not understood, Durham, '02, believes that the

sexual stage of a related South American species is passed in a tick. Quite similar to *Lankesterella* of frogs are species of the genus *Haemogregarina* which may be readily found in turtles and snakes.

Coming closer to the malarial parasites, the bird parasites, which have been so important in elucidating the life cycle of the human malaria are available. I have found about 50 per cent. of the crows taken around Ithaca, in the summer, infested with *Halteridium*. It is much rarer in the English sparrows.

Proteosoma is to be found in the English sparrows at Ithaca though in no such astounding percentages as Berkeley reports for New York where, he states, he "found Proteosoma infection in 75 per cent. or more of all sparrows examined" in September. I have not found them in more than 6 per cent. of those examined, and apparently Opie was no more successful at Baltimore.

Of course, occasionally opportunities for the study of human malaria may arise and these will be more frequent as physicians understand that one is prepared and willing to make such examinations.

Of the higher parasites which are insect borne the most important are the filariae. About three out of four of the crows about Ithaca harbor at all times of the year a blood filaria which is a striking object for study. Another species I have found once in an English sparrow at Ithaca. Though these blood filaria of the crow are five times as long as the blood corpuscles, they may be present in enormous numbers. Mr. Coutaunt and I have estimated that 500 occurred in a single drop of blood in one specimen examined. The record is held by a crow which I used in a practicum last year. The parasites were so abundant that I had independent estimates made by each of twelve careful students. The figures averaged nearly 2,000 for a single mount. No figure was lower than 2,000.

The double-pored tapeworm, *Dipylidium caninum*, of dogs and cats passes its intermediate stage in the flea and the louse, as many as fifty cysticercoids being found in a single flea.

Though the adult worm is common at Ithaca I have not located the immature stage as yet.

These are but a few illustrations of forms that are available and which may be studied without complicated apparatus or special training beyond that gained in the course of the work. As an aid in beginning such study, demonstration specimens of a few of the blood parasites may be purchased. Some of these are to be obtained from the Western Biological Supply Co., Station A, Lincoln, Nebr., and a larger assortment is handled by W. Watson & Sons, 313 High Holborn, W. C., London. Helpful as such specimens may be, no one who has once examined the living parasites or his own preparations, will be satisfied to depend on the meager opportunities for purchasing material of this nature.

Cystodiplosis eugeniae n. sp. (Dipt.).

By E. P. Felt, Albany, N. Y.

The midges provisionally referred to this genus were reared in April, 1912, from hairy leaf galls on *Eugenia buxifolia*, collected by Dr. E. A. Schwarz at Key West. The transformations are completed within the gall, since several protruding exuviae were observed. The galls occur in irregular clusters of 10 to 15 or more upon the upper surface of the leaves.

Gall. Irregularly spherical or somewhat elongate, monothalamous, with a diameter of about 1.5 mm. The walls of the gall are moderately thick, quite high and exteriorly thickly clothed with long, crinkly, yellowish or reddish brown hairs.

Exuviae. Length 2.5 mm., whitish transparent. Antennal cases short; thoracic horns rudimentary; leg cases extending to the 7th and 8th abdominal segments, the wing cases to the third. Dorsum of the abdomen thickly and uniformly clothed with stout, chitinous points.

Male. Length 1.5 mm. Palpi composed of one minute oval segment. Mesonotum and scutellum dark brown. Abdomen mostly light reddish brown and sparsely clothed with yellowish setae. Genitalia slightly darker. Wing narrow, length 2.4 mm., width .9 mm.; the subcosta unites with costa at the basal third, the third vein at the apex, the fifth is well developed basally and obsolescent, including the branches, apically. Legs yellowish brown, the femora slender and slightly longer than the more slender tibiae; claws very long, slender, simple, the pulvilli about one-half the length of the claws. Genitalia: basal clasp segment greatly swollen, much resembling that of *Asphondylia;* terminal

clasp segment subapical, short, obese, apically with a heavy, chitinous spur and internally with a group of thick, long setae; dorsal plate divided, the lobes roundly triangular; ventral plate short, tapering broadly to a broad, slightly emarginate setose apex. Harpes rather long, slender, somewhat spoon-shaped, well chitinized.

Female. Length 1.5 mm. Antennae (presumably female), third and fourth segments free, the fifth with a stem about one-fifth the length of the cylindric basal enlargement, which latter has a length two-and-one-fourth times its diameter, a rudimentary basal whorl of setae and low apparently anastomosing circumfili, these latter suggesting somewhat the condition seen in the male antennae of *Asphondylia*. Ovipositor short, fleshy, with a length less than one-fourth that of the abdomen, the terminal segment being stout and terminating in rather broad, triangular lobes. Other characters, so far as observed, practically as in the male.

Type Cecid a2378.

The specimens from which the above description was drafted are badly broken and our only excuse for the characterization is that the biological data may be preserved. The species is so peculiar that there should be no difficulty in identifying the midge from the data we have given. It is possible that this species represents a new genus in the Asphondyliariae, something which can be determined best after perfect specimens of both sexes are available.

A New Species of Dixa from Chile (Dixidae, Dipt.).

By CHARLES P. ALEXANDER, Ithaca, N. Y.*

In a collection of Neotropical crane-flies belonging to the Hungarian National Museum and kindly sent to me for determination by Dr. Kertesz, there was included a species of *Dixa* from Chile. This is the first record for a member of this family of flies from south of the Equator. Of the 21 described species, 12 are European, 8 are American and 1 is Chinese. Of the American species all are Nearctic with the exception of the widely distributed *Dixa clavulus* Williston† which was described from the Island of St. Vincent. Dr. Johannsen has examined this specimen and states that it is very different from

*Contribution from the Entomological Laboratory of Cornell University.

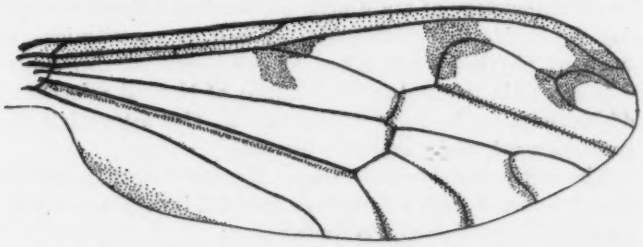
†Trans. Ent. Soc. Lond., 1896. Part 3, p. 298, fig. 73.

any of the American species, the types of which he has studied in Cambridge.

Dixa chilensis sp. n.

Male. Length about 3.5 mm.; wing 3.8 mm. Mouth parts and palpi dark brownish black; clypeus and front yellowish, suffused with brown on the sides; antennae dark brown, the third segment much paler, more yellowish; vertex and occiput pale yellowish-white.

Pronotum light chestnut brown; mesonotum, praescutum very pale, almost white with three dorsal stripes; the intermediate stripe is broader and begins just behind the cephalic margin of the sclerite; the lateral stripes are narrower, begin at about mid-length of the sclerite, continuing caudad and including the sides of the scutum; middle line of the scutum and the scutellum dull yellowish; postnotum dark brown. Pleurae with a broad silvery white band, delimited by two narrow dark brown stripes, the upper one beginning on the cervical sclerites and running to the base of the halteres; the lower stripe running above the bases of the coxae. Halteres pale, apices of the knobs dark brown. Legs, fore and middle coxae yellow, brownish in front, trochanters pale, whitish-yellow; femora and tibiae very light brown, narrowly tipped with dark brown; tarsi brown; hind legs, femora much brighter colored, yellowish, broadly tipped with brownish black; tibiæ dark on basal half, passing into a broad, dull yellowish post-median band; tip of tibia swollen, black; tarsi brown. Wings, subhyaline, cells *C* and *Sc* more yellowish; an irregular brown mark at the origin of *Rs*, a second at the arcuation of *R*2+3, a third at the top of *R*1 extending down over the fork of *R* 2+3; cross veins and many of the longitudinal veins narrowly and indistinctly seamed with a lighter brown; anal cell a little brown



on the angle; venation (see figure), cross vein *r-m* far before fork of *Rs*; *R* 2 +3 at origin perpendicular, extremely arcuated, fork of *R* 2+3 much shorter than the fused portion.

Abdomen brown.

Holotype, ♂, Concepcion, Chile; Aug. 23, 1904 (P. Herbst). Type in the Ungarisches National Museum.

The species differs from all of the known American forms in the extreme arcuation of R 2+3 and the shortness of the fork of this vein.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

TO CONTRIBUTORS.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, four weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form and without covers, will be given free, when they are wanted; if more than twenty-five copies are desired, this should be stated on the MS. The receipt of all papers will be acknowledged. Proof will be sent to authors for correction only when specially requested.—Ed.

PHILADELPHIA, PA., APRIL, 1913.

According to *Science* for January 17 last, there were presented to the scientific societies, meeting at Cleveland, Ohio, in Convocation week, 1912-13, 822 papers. The highest number accredited to any one science was 84 to Zoology, Entomology being second with 73.

The February number of the NEWS, in the department of Entomological Literature, listed the titles of 103 papers pertaining to the entomology of the Americas (North and South) including Arachnida and Myriopoda, as well as contributions to anatomy, physiology and embryology of insects whether American or exotic, received at the Academy of Natural Sciences of Philadelphia in the space of one month. This list professedly excludes much of the economic literature.

The newly-established *Review of Applied Entomology*, Volume I, Series A, part 1 (reference to which is made on another page of this number of the NEWS) says:

> It is not perhaps generally realized how numerous or how varied are the existing publications which are liable to contain entomological information. A preliminary survey of the subject has resulted in the compilation of a list (by no means complete) of no less than 1,700 periodicals—scientific, agricultural and medical,—which may contain articles dealing with entomology . . . Furthermore, the number of periodicals expressly dealing with Economic Entomology is steadily growing from year to year; and this is due not only to a more

general recognition of the high importance of this subject both in its agricultural and medical aspects, but also to the greater activity in the development of tropical areas, where the depredations of insects are most severely felt. It may be said with some degree of certainty, that there is at present no single institution in the world at which all these multifarious journals may be consulted.

Much current literature in Entomology, as in other subjects, is not orginal or important, but the quantity which is entitled to these two adjectives is so great that the necessity of listing or abstracting it for the use of investigators becomes more pressing every year. The *Review* just quoted is the latest attempt to do this in certain entomological fields. All the existing bibliographical agencies appear to be necessary, for experience has shown that no one of them succeeds in attaining completeness. Whether this failure is partly due to the fact that some authors and publication agencies send their work to one bibliographer, some to other recorders, seems to be a matter well worthy of consideration by those in charge of such praiseworthy and useful drudgery.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

The British Imperial Bureau of Entomology.

In the summer of 1911, when the prime ministers of the self-governing dominions were present in England, they were invited by the Secretary of State for the Colonies to discuss with the Entomological Research Committee (appointed by the Colonial office in 1909) certain proposals for furthering and co-ordinating the investigation of injurious insects throughout the Empire. At this meeting it was unanimously ageed that the establishment of a central organization for this purpose was desirable, and consequently a tentative scheme was submitted for the consideration of the Colonial Governments concerned.

At a further conference, held at the Colonial office in August, 1912, the matter took more definite shape, and it was proposed to form an Imperial Bureau of Entomology, to be supported by contributions from the various Dominions and Colonies, as well as from the British Government. The principal functions of this bureau will be to collect and co-ordinate all information bearing upon injurious or useful insects; to organize a system for securing the authoritative identifica-

tion, with reasonable promptitude, of all insects of economic importance submitted by officials connected with Departments of Agriculture or Public Health throughout the empire; to compile gradually a comprehensive card-index to the whole literature of the subject; and to publish monthly the present journal, which is intended to give an up-to-date epitome of the current literature.

The bureau is fortunate in having secured as its president so eminent an administrator as the Earl of Cromer, and the names of the many distinguished gentlemen who have been good enough to act on the Honorary Committee of Management will be sufficient guarantee that its work will be carried out in an efficient and sympathetic manner.

[The three preceding paragraphs have been taken from the Preface, page 1, Series A, Vol. I, of the journal referred to in the second of those paragraphs, *The Review of Applied Entomology, Issued by the Imperial Bureau of Entomology*. It is issued in two series: A. Agricultural, B. Medical and Veterinary. Vol. I, Ser. A, Part 1 consists of 32 pages, Vol. I. Ser. B, Part 1 of 20 pages; both are dated January, 1913. The subscription to both series is 12 shillings per annum or, separately, A 8 sh., B 5 sh., orders and subscriptions to be sent to Messrs. Dulau & Co., Ltd., 37 Soho Square, London, W. The Honorary Committee of Management is composed of the same persons as constitute the Entomological Research Committee (Tropical Africa). The general secretary of the bureau is likewise Mr. A. C. C. Parkinson; the Director and Editor, Mr. Guy A. K. Marshall; Assistant Editor, Mr. W. North. The head office is at the British Museum of Natural History, the publication office at 27 Elvaston Place, London, S. W.]

An Entomologist Wanted for Arcadia.

We want an adult entomologist, preferably a married man, to come to Arcadia, lease a building site, erect a small cottage and live near to nature in the spirit of the Institution. He shall have the freedom of the Institution without expense, but for his services no salary will be paid. We are looking for some one who has retired from the active duties of life, and expects to spend the rest of his days in close proximity to the entomological world.

Arcadia is well equipped with every facility for studying nature and especially so in entomology. Within the adjacent territory, especially in Nymphalia, which is a part of Arcadia, there are facilities for studying various kinds of aquatic and marsh insects. The laboratory is well equipped with apparatus for classifying, examining, photographing, etc. There are breeding cages for studying the insects in their transformations, and whatever further equipment may be necessary will be made to suit the needs of a student.

Full particulars as to what the Agassiz Association is and what is its Arcadia, what it has done and what it is trying to do, and including a copy of "The Guide to Nature," will be sent upon application.

On the other hand, full particulars will be required of the personality, skill, experience, plans, etc., of the applicant who would come here and take charge of our Entomological Department. We would prefer some one who has retired from active business life and has means to devote the rest of his days to his favorite pursuits, but such entire devotion of time is not necessary. Arrangements could be made for some income for services, if desired. Employment of various kinds can be obtained in the vicinity, but, as previously stated, the ideal would be one who has retired and intends to devote all the rest of his time to the interests and beauties of entomological nature.

For further particulars apply to The Agassiz Association, Edward F. Bigelow, President, Arcadia, Sound Beach, Connecticut.

Entomological Meeting in California, 1915.

The Entomological Society of America has received an invitation from the Panama-Pacific International Exposition to hold a meeting in some Californian locality in the summer of 1915. This gathering may be at either of the universities or on the exposition grounds. It has received the enthusiastic support of western entomologists. These latter have attended many eastern meetings and this is an excellent chance for us to return the compliment. It may be possible for a number to go out with a party, stopping off at one or more interesting points en route. As chairman of a special committee to consider this matter and report at the next meeting of the Association, the undersigned would welcome suggestions in regard to this meeting and also expressions relative to the support it would probably receive from eastern entomologists.—E. P. Felt, State Museum, Albany, New York.

[Attention may be called to the fact that the time of this proposed meeting coincides with that of the Third International Congress of Entomology, to be held at Vienna.—Ed.]

Some Nomenclatural Questions.

To the Editor, Entomological News.

Sir:

A case anent the whole discussion of nomenclatorial priority.

The Coleopterous family Trogositidae was separated by Rev. W. Kirby (1826) from the Nitidulidae, where the group was lumped by Erichson. Family based on type *Trogosita* (Olivier) *mauritanica* (Linné). In 1865 (circa) it was discovered that Pallas had previously erected the genus *Tenebrioides* to fit this species. Therefore the

name *Trogosita* falls as a synonym. Secondly—Pallas by a printer's error was made to say *"Tenebroides."* Thirdly—J. O. Westwood (1840?) separated *virescens* as a new genus—under name *Temnochila.* Under the law, what is the name of this family? The priority name is Trogositidae, based on a type name now non-existent. European writers have adopted *Temnochilidae.* On family names the law of 1832 is silent. Meanwhile, the genus *Ostoma* Laich (1783) was based on *Peltis* (Illiger circa, 1805) *ferruginea* Linné.

Should the misprint "Tenebroides," an obvious error, stand? Should the family be "Trogositidae," "Temnochilidae" or "Ostomidae"? Does the law of 1832 refer to families?

Linné suffered from a printer's error, "Dyticidae" (Greek dyticus =a diver). All subsequent authors are printing *Dytiscus,* an obvious error, until corrected by Encyclopedia Britannica, 11th edition (*v,* article Coleoptera).

The coleopterous genus, *Cnemidotus,* Illiger, 1802, was based on a *Haliplus.* Erichson redescribed the genus, using the same name, based on *caesus,* Duft., 1832. The type of the genus still stands. The law of priority, specifying that a synonym may not again be used, was adopted subsequently to Erichson's description. Ex post facto legislation is hardly acceptable. It is proper, then, that Regimbart in 1878, should put *Cnemidotus* back into synonomy in favor of his own parallel creation, *Peltodytes?*

Does not your census show that strictly taxonomic students are in favor of strict priority by about 3 to 1? The majority on the other side was made by amateurs, 10 to 1, and economic students 4 to 1.

Again, is not real opinion 5 to 1 in favor of strict priority, at least, in case of species?

I think it is generally conceded that no definition of "genus" has been written which is acceptable widely anywhere. Certainly, when Hübner wrote on Lepidoptera, he had no idea of a genus which coincides with any other opinion. Moreover, has anyone (in Coleoptera, at least) acceptably defined a family, except Leconte?

The nomenclature problem is the most important matter to come before a world's congress.

Sincerely,

R. P. Dow.

Recollections of A. R. Grote, by John G. Milburn.

[I have in my library the first two volumes of the Proceedings of the Buffalo Society of Natural Sciences bound, and on the title page the inscription, "E. C. Sprague, Esq., with Compliments of Augustus R. Grote and John George Milburn." In each volume is the book-plate of E. C. Sprague. Last September, in looking over a number of the

American Historical Review, I saw the notice of a paper read at a meeting of the Buffalo Historical Society by John G. Milburn; of course I recognized the name, and immediately wrote to Mr. Milburn at Buffalo, from which place my letter was forwarded to his present home in New York City. I have just received a reply which is of such interest to one interested in the lives of naturalists, that I here give some of it to the readers of the NEWS.—F. GRINNELL, JR., Pasadena, Cal., December 24, 1912.]

"I am sorry that I cannot tell you much about Grote. He was the director of the museum on a small salary and in the front rank of entomologists. He was, I should say, in the middle of the '70's, somewhat over thirty years of age, dark, slight in build, and of a nervous, mercurial temperament. He was a man of general culture, quite a poet, and devoted to music. I have a dim recollection that he had some connection as an organist with church work; but I may be all wrong about that. He was a delightful companion and a good talker. Those were the days when Darwinism was spreading fast, and of what used to be called the conflict between science and religion. Grote was rather the leader of the group of young men to which I have referred, and for them every problem of the universe was in the melting pot.

When Grote was not occupied in identifying or describing some new species, he was writing a lyric, composing an opera, or recasting theology. He was a very vivid and interesting personality.

. . . . . (Signed) JOHN G. MILBURN.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published, and are all dated the current year unless otherwise noted, always excepting those appearing in the January and February issues, which are generally dated the year previous.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington.

2—Transactions, American Entomological Society, Philadelphia. **4**—The Canadian Entomologist. **5**—Psyche. **7**—U. S. Department of Agriculture, Bureau of Entomology. **8**—The Entomologist's Monthly Magazine, London. **10**—Nature, London. **11**—Annals and

Magazine of Natural History, London. **12**—Comptes Rendus, L'Academie des Sciences, Paris. **13**—Comptes Rendus, Societe de Biologie, Paris. **18**—Ottawa Naturalist. **22**—Zoologischer Anzeiger, Leipzig. **30**—Memoires, Societe Zoologique de France, Paris. **40**—Societas Entomologica, Zurich. **73**—Archives, Zoologie Experimentale et Generale, Paris. **79**—La Nature, Paris. **89**—Zoologische Jahrbucher, Jena. **97**—Zeitschrift fur wissenschaftliche Zoologie, Leipzig. **166**—Internationale Entomologische Zeitschrift, Guben. **184**—Journal of Experimental Zoology, Philadelphia. **191**—Natur, Munchen. **193**—Entomologische Blatter, Cassel. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **200**—Bulletin Scientifique de la France et de Belgique, Paris. **204**—New York State Museum, Albany. **216**—Entomologische Zeitschrift, Frankfurt a. M. **223**—Broteria. Revista de Sciencias Naturaes do Collegio de S. Fiel (Ser. Zoologica). **246**—Bulletin International, Academie des Sciences de Cracovie, Ser. B. Sciences Naturelles. **269**—Memoirs, Department of Agriculture in India. Entomological Series, Calcutta. **274**—Archiv fur Zellforschung, herausgegeben von Dr. R. Goldschmidt, Leipzig. **278**—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. **284**—Bulletin, Museum National d'Histoire Naturelle, Reunion Mensuelle des Naturalistes du Museum, Paris. **332**—Bulletin of the Southern California Academy of Sciences, Los Angeles.. **335**—Smithsonian Miscellaneous Collection. **385**—Festschrift zum Sechzigsten Geburtstag Richard Hertwigs. **394**—Parasitology, Cambridge, England. **407**—Journal of Genetics, Cambridge, England. **419**—Transactions of the Canadian Institute, Toronto. **420**—Insecutor Inscitiae Menstruus: a monthly journal of entomology, Washington, D. C.

GENERAL SUBJECT. Cockerell, T. D. A.—Nomenclature at the Zoological Congress, **10,** 1913, 648-49. **Cosens, A.**—A contribution to the morphology and biology of insect galls, **419,** ix, 297-387. **Forbes, S. A.**—Report (27) of the state entomologist of Illinois. **Galloway, T. W.**—Zoology. Phila: P. Blakiston's Sons & Co., 1912, 481 pp. **Hartert, E.**—Gegen die zulassung von ausnahmen vom prioritatsgesetz, **166,** vi, 317-318; **193,** 1913, 24-26. **Macnamara, C.**—The milkweed and insects, **18,** 1913, 151. **Meissner, O.**—Praktische zuchtkasten, **40,** xxviii, 13-14. **Nabert, A.**—Die corpora allata der insekten, **97,** civ, 181-358. **Rosenau, M. J.**—Some experimental observations upon monkeys concerning the transmission of poliomyelitis through the agency of "Stomoxys calcitrans," **5,** 1912, 191-194. **Schroder, C.**—Handbuch der entomologie, Erste Lief., Jena, 1912. **Steudel, A.**—Absorption und secretion im darm

von insekten, **89,** xxxiii, 165-224. **Toyama, K.**—Maternal inheritance and mendelism (silk worm), **407,** ii, 315-405. **Wright, W. G.**—Obituary, **332,** xii, 19-21.

ARACHNIDA, ETC. Bonnevie, K.—Ueber die struktur und genese der Ascarischromosomen, **274,** ix, 433-57. **Fabre, J. H.**—The life of the spider (Translation), New York, 1913, 404 pp. **Goldschmidt, R.**—Das nervensystem von "Ascaris lumbricoides und megalocephala," **385,** ii, 255-354. **Hadwen, S.**—The life-history of "Dermacentor variabilis," **394,** v, 234-237. **Hirschler, J.**—Ueber die plasmastrukturen in den geschlechtszellen der Ascariden, **274,** ix, 351-398. **Phisalix, M.**—Effets physiologiques du venin de la mygale de Haiti (Phormictopus carcerides) et de Corse (Cteniza sauvagei), **284,** 1912, 132-138. **Schtschelkanowzew, J. P.**—Der bau der mannlichen geschlechtsorgane von Chelifer und Chernes, **385,** ii, 1-38, 1910. **Sokolow, I.**—Untersuchungen ueber die spermatogenese bei den Arachniden, **274,** ix, 399-432.

Clark, A. H.—Notes on American sp. of Peripatus, with a list of known forms, **335,** lx, No. 17, 5 pp. **Clarke & Ruedemann.**—The Eurypterida of New York, **204,** Mem. 14, vol. 1-2, 628 pp. **Muralewic, W. S.**—Einige bemerkungen ueber aussereuropaische Scolopendriden, **22,** xli, 196-202. **Ribaut, H.**—Ascospermorphora (Myriophodes), **73,** x, 399-478.

APTERA AND NEUROPTERA. Boring, A. M.—The odd chromosome in "Cerastipsocus venosus," **198,** xxiv, 125-132. **Bugnion, E.**—L'imago du "Coptotermes flavus." Larves portant des rudimentes d'ailes prothoraciques, **30,** xxiv, 96-106. **Waterson, J.**—A suggestion for securing certain Liotheids (Mallophaga), **8,** 1913, 36.

Aulmann, G.—Psyllidarum catalogus, 92 pp. (W. Junk, Berlin, 1913). **Navas, L.**—Neuropteros nuevos de America (conclusion), **223,** xi, 45-53.

ORTHOPTERA. Meunier, F.—L'asymetrie frequente des elytres de Blattidae du terrain houiller de Commentry et la phylogenie des groupes, **12,** 1913, 493-96. **Ramme, W.**—(See under Coleoptera.)

Carl, J.—Phasmides nouveaux ou peu connus du Museum de Geneve, **278,** xxi, No. 1, 56 pp.

HEMIPTERA. Boring, A. M.—The chromosomes of the Cercopidae, **198,** xxiv, 133-146. **Brocher, F.**—Recherches sur la respiration des insectes aquatiques adultes. La Notonectes (2d article), **89,** xxxiii, 225-234. **Butler, E. A.**—A contribution towards the life

history of "Berytus clavipes," **8,** 1913, 28-32. **Foot & Strobell.**—Preliminary notes on the results of crossing two hemipterous species with reference to the inheritance of an exclusively male character . . . **198,** xxiv, 187-204. **Johannes, Dr.**—Biologisches ueber die bekanntesten wasserwanzen, **191,** 1913, 221-222. **Rigakuhakushi, C. S.**—Life history of "Schlechtendalia Chinensis" (a gall-producing insect), **385,** ii, 241-252.

Lindinger, L.—Die schildlause (Coccidae), Europas, Nordafrikas und Vorderasiens . . ., Stuttgart, 1912, 388 pp. **Sasscer, E. R.**—An index to catalogues of recently described Coccidae, **7,** Tech. Ser. 16, pt. 7. **de la Torre Bueno, J. R.**—Some heteropterous hemiptera from Southern Pines, N. C., **4,** 1913, 57-60.

LEPIDOPTERA. Bartsch, R. C. B.—"Sugaring" in the autumn, **5,** 1912, 195-199. **Fuchs, F.**—Zur biologie von Heterogynis pennella, **216,** xxiv, 179-180, 182. **Gillmer, M.**—Zum ueberwinterungszustand der schmetterlinge, **166,** vi, 301-302. **Guyenot, E.**—Les papilles de la trompe des lepidopteres, **200,** xlvi, 288-346. **Kopec, S.**—Regenerationsversuche an fuhlern, augen . . . der schmetterlingsraupen und imagines, **246,** 1912, 1096-1102. **Linstow, Prof.**—Die sinne und sinnesorgane der raupen, **166,** vi, 299-301. **Marsh, H. O.**—The horse-radish webworm (Plutella armoracia), **7,** Bul. 109, pt. 7. **Martini, W.**—Beitrage zur kenntnis der Elachistaraupen, **216,** xxvi, 174-75. **Menzel, H.**—Einfluss der ausseren umgebung auf die farbung der schmetterlingspuppen (Vanessa urticae), **89,** xxxiii, 235-258. **Reiff, W.**—Ueber den schmetterlingsfang am licht, **166,** vi, 310-11. **Schwangart, Dr.**—Ueber die traubenwickler (Conchylis ambiguella und Polychrosis botrana) und ihre bekampfung . . ., **385,** ii, 465-534.

Dyar, H. G.—Notes on cotton moths, **420,** i, 1-12.

DIPTERA. Esterly, C. O.—The "oil fly" of So. California (Psilopa petrolei), **332,** xii, 9-11. **Green, E. E.**—On the humming of Chironomidae, **8,** 1913, 37. **Guyenot, E.**—Etudes biologiques sur une mouche "Drosophila ampelophila," **13,** 178-182, 223-225. **Lutz, F. E.**—Experiments concerning the sexual difference in the wing length of "Drosophila ampelophila," **184,** xiv, 267-274. **Richardson, C. H., Jr.**—Notes on the life-history of "Corethra albipes," **5,** 1912, 200-203.

Alexander, C. P.—New Nearctic Tipulidae, **5,** 1912, 163-171. **Johnson, C. W.**—The No. American species of the genus Haemalopota, **5,** 1912, 181-183. **Malloch & Knab.**—"Limosina mirabilis," a sp. of Borboridae new to the U. S., **5,** 1912, 199. **Townsend, C. H. T.**—Inquiry into the relationship and taxonomy of muscoid flies, **4,** 1913, 37-57.

COLEOPTERA. Champion, G. C.—Note on the larva of Scirtes, **8**, 1913, 32-33. **Frost, C. A.**—Note on "Tricrania sanguinipennis," **5**, 1912, 208. **Holdhaus, K.**—Ueber die wissenschaftliche und praktische bedeutung des zu schaffenden "Ganglbauerpreises," **193**, 1913, 8-12. **Hunter & Pierce.**—The movement of the cotton boll weevil in 1912, **1**, Circ. 167. **Ramme, W.**—Die bedeutung des proventriculus bei Coleopteren und Orthopteren, **89**, xxxv, 419-456. **Urban, C.**—Beitrage zur lebensgeschichte der kafer, **193**, 1913, 16-19 (cont.).

HYMENOPTERA. Acloque, A.—Les fourmis a miel des deserts mexicains, **79**, 1913, 161-163. **Davidson, A.**—Masaria vespoides, **332**, xii, 17-18. **Dutt, G. R.**—Life histories of Indian H., **269**, iv, 183-267. **Sladen, F. W. L.**—The humble-bee, its life-history and how to domesticate it; with descriptions of all the British species of Bombus and Psithyrus, London, 1912, 283 pp. **Turner, C. H.**—An orphan colony of "Polistes pallipes," **5**, 1912, 184-190.

Cockerell, T. D. A.—(Change genus Hoplitella to Hoplitina), **4**, 1913, 34. Descriptions and records of bees.—XLIX, **11**, xi, 185-195 (cont.). **Franklin, H. J.**—The Bombidae of the New World (Pt. 1), **2**, xxxviii, 177-486. **Wheeler, W. M.**—Additions to our knowledge of the ants of the genus Myrmecocystus, **5**, 1912, 172-181. The male of "Eciton vagans," **5**, 1912, 206-207.

A Contribution to the Morphology and Biology of Insect Galls. By A. Cosens, M.A. Reprinted from the Transactions of the Canadian Institute, Vol. IX, pp. 297-387, 1912. University Press, Toronto; 13 plates.

This paper, both botanical and entomological in its character, describes investigations carried on in the Botanical Laboratories of the University of Toronto under the supervision of Prof. J. H. Faull. Only its entomological results are dealt with here. The anatomical and histological structure of galls produced by 8 species of Acarina, 8 Aphididae, 1 Psyllid, 1 Sesiid, 1 Tortricid, 2 Gelechiids, 1 Tineid, 12 Cecidomyidae, 10 Nematinae, and 24 Cynipidae are described; the order in which they are treated—Acarina, Hemiptera, Lepidoptera, Diptera, Hymenoptera—corresponds in a general way with an increasing complexity in the galls.

In dealing with the Lepidopterous galls attention is called to "the highly specialized habits of the larva, developed in caring for the welfare of the imago..... Thus in each of the forms studied provision is made by the larva for the emergence of the moth from the gall. These habits are seen at different stages of development. In *Stagmatophora ceanothiella* Cosens, and *Eucosma scudderiana* Clem-

ens, the gall wall is simply gnawn partly through, while in *Gnorimoschema* an aperture of exit is carefully prepared and plugged. These different methods of procedure are remarkably suited to the habits of the insects. In the former a plugged exit would not be suitable, as the insect winters in the larval condition and the drying of the gall would prevent the plug from slipping out easily. In the latter the galls are still green when the insect becomes mature and the plug mechanism is preferable. It is clear then, that in these galls the producer is much more active in providing for its own welfare than in the higher types and the plant renders a relatively smaller amount of assistance . . . . As I have repeatedly found the opening through which the larva of *Eucosma scudderiana* has entered the stem [of *Solidago*], it is certain that this Lepidopterous producer always oviposits on the outside of the host, and this may prove to be true of the entire group."

Adler found that cell proliferation on the part of the plant to form saw-fly galls preceded the hatching of the saw-fly's egg and hence concluded that these galls, in contradistinction to those produced by other insects, owe their origin to the wound caused by oviposition. Mr. Cosens obtained galls of three species of *Pontania*, of this family, with the larvae still within the egg and here also considerable proliferation of plant tissue had already occurred. He suggests the "slight possibility that secretions or excretions from the developing larva may be active through the egg membrane" as the gall-forming stimulus.

The walls of Cynipid galls are usually differentiated into an inner nutritive, and an outer "protective," zone. Adler held the latter to be a defence against parasites, but Mr. Cosens found seventy-five per cent. of the galls of *Amphibolips confluens* parasitized in spite of its thick epidermis and well-developed protective sheath. "Apparently the only protective function that can be ascribed to this tissue is the prevention of injury to the producer by desiccation during its later larval and pupal stages of development."

Gall-producing larvae differ in their habits of feeding on the gall tissue. In the Acarina (Eriophyidae), Hemiptera (Aphididae, Psyllidae), Diptera (Cecidomyidae, Trypetidae) and Cynipidae (but not inquilines), the cell contents alone furnish the nourishment and these are withdrawn from the cells without destroying the cell-walls. On the other hand, Lepidopterous, Coleopterous, and Tenthredinid gall-producing larvae, and at least some inquiline Cynipid larvae, devour both the cell-walls and the cell-contents. Mr. Cosens made experiments showing that the larvae of the Cynipid *Amphibolips confluens* secretes a salivary gland enzyme which changes starch to sugar; he holds that this ferment "must act through the cell membrane lining

the interior of the larval chamber." From serial cross-sections he finds that the alimentary canal of *Philonix nigra* and *Amphibolips confluens*, both gall-producers, is complete throughout and possesses an anus, quite the reverse of previous ideas on this detail of Cynipid anatomy. No fragments of plant cell-walls were found in the intestinal lumen of these two species, although such were found in the similarly sectioned lumen of an inquiline. He also obtained evidence that inquilines have a limited ability to stimulate gall-production.

On the question of the response of the plant to the stimulus effected by the insect leading to the production of a characteristic gall, Mr. Cosens rejects the conventional view that the protoplasm of the plant has been endowed with entirely new characteristics and shows that the apparently new tissues of the gall can be found in other normal parts of the host or of its relatives.

Another interesting relation between plant and insect is summarized thus: "The larva secretes an enzyme capable of changing starch to sugar which acts on the starchy constituents of the nutritive zone [of the gall] and accelerates the rate of their change to sugar. The material thus prepared supplies nourishment for both the larva and the gall."

There is a bibliography of 46 titles. The thirteen plates contain 85 figures reproduced by the Heliotype Co., of Boston, from photographs of sections of galls.

Doings of Societies.

AMERICAN ENTOMOLOGICAL SOCIETY.

Meeting of December 9th, 1912, Dr. Philip P. Calvert, President, in the chair. Nine persons present. The reports of the Treasurer, Curator, Librarian and Publication Committee were read. The annual election was held and the following persons were elected to serve as officers for the year 1913: President, Philip P. Calvert; Vice-President, H. W. Wenzel; Treasurer, E. T. Cresson; Curator, Henry Skinner; Librarian, E. T. Cresson, Jr.; Recording Secretary, Henry Skinner; Corresponding Secretary, J. A. G. Rehn; Publication Committee, E. T. Cresson, C. F. Seiss, B. H. Smith; Executive Committee, P. Laurent, H. W. Wenzel, D. M. Castle; Finance Committee, C. S. Welles, D. M. Castle, Morgan Hebard.

Meeting of February 27th, 1913, Dr. Philip P. Calvert, President, in the chair.

Dr. Skinner made some remarks on the Hesperid genus

Thanaos and referred to the value of the genitalia as characters for specific separation.

Mr. Rehn exhibited the type specimens of three species of Argentine Orthoptera which also represent three previously unknown genera. The first, a walking stick, belongs to a group of genera peculiar to Paraguay and the adjacent portion of northern Argentina. The second, a member of the Acridid subfamily *Ommexechinae*, is a most interesting annectant type as it connects in numerous characters two heretofore rather widely separated sections of the sub-family. The third genus is a very remarkable katydid type more nearly related to the genus *Insara* than to anything else. The latter genus reaches its greatest development in Central America and it seems doubtful that several species recorded from South America and assigned to the genus really belong there. The collection of which the new genera form part was made by Mr. P. Jorgensen and the study of the same developed the fact that fifty-six of the total of one hundred and sixty-two species had not previously been recorded from Argentina. The major portion of the series was from the northeastern territory of the Missiones, which is the most tropical portion of the country, the majority of the species found there being Brazilian types.

Mr. Hornig said he had collected cocoons of *Callosamia angulifera* suspended by silk from the twigs of the tulip tree and exhibited a suspended cocoon which he thought was *angulifera*.

Dr. Calvert referred to studies of the honey bee made by Dr. D. B. Casteel, in which he had corrected erroneous ideas as to the physiology of parts of the legs of these insects.

HENRY SKINNER, *Secretary*.

NEWARK ENTOMOLOGICAAL SOCIETY.

Meeting of January 14, 1912, in Newark Turnhall, Newark, New Jersey. President Buchholz in the chair and fourteen members present.

Mr. Brehme showed 38 different forms of *Apantesis* and Mr. Buchholz 34 forms.

Meeting of February 11, 1912, in Turnhall. President Buchholz in the chair and twenty-one members present.

Resolved unanimously to move headquarters from Turnhall to Newark Free Public Library.

Resolved unanimously, on motion by Dr. McCormick, to draw up a resolution to thank the Newark Turnverein for having given hospitality to our society for some years.

Mr. Keller showed male and female of *Catocala herodias,* also the type of *Catocala albida.*

Mr. George Franck gave a very interesting talk on collecting Lepidoptera in the Catskills (Mountain Crest House, on the Tannersville Railroad), and showed specimens which he caught there, also a very interesting box of different Catocalas.

Meeting of March 10, 1912, in the Free Public Library. President Buchholz in the chair, sixteen members present.

Mr. Bischoff inquired about the making up of a public collection of insects, which led to the question of uniform labels. To take up this matter, a committee was appointed, consisting of Mr. Bischoff, Mr. Rommel and Mr. Keller.

A committee on field meetings was appointed as follows: Messrs. Stortz, Herman Brehme and Rommel.

Special meeting held at Mr. Herman H. Brehme's residence March 13, 1912, on account of the death of Dr. John B. Smith, one of the members of our society. Mr. Buchholz presided. Fourteen members present.

A letter was received with invitation to attend the funeral of Dr. Smith. This invitation was accepted.

Resolved to have suitable resolutions drafted and engrossed, and have them inserted in the "Sunday Call" and in the "Ezrahler" of the New Jersey Freie Zeitung. Also to have a floral piece placed on his coffin.

Meeting of September 8, 1912, in the Free Public Library, Mr. Buchholz presiding and twelve members present.

Mr. Doll reported the capture of hibernating Noctuidae: *Jodia rufago* and *Copipanolis cubilis*, both in early spring.

Mr. Buchholz caught *Catocala phalanga* in Elizabeth, September 8.

Mr. Lemmer found caterpillars of *Catocala epione* on butter nut.

Meeting of November 10, 1912, in the Library, Mr. Buchholz presiding and eleven members present.

A letter was received from the Newark Museum Association asking our society to help to make up a collection of New Jersey insects. The secretary was ordered to inform them to have 12 exhibition cases ready for our society to fill with insects of our State.

Meeting of December 8, 1912, in the Free Public Library, Mr. Buchholz presiding and fourteen members present.

The following officers for the year 1913 were elected: President, Otto Buchholz, re-elected; Vice-President, Henry H. Brehme; Secretary, Frederick Lemmer, re-elected; Financial Secretary, T. David Mayfield, re-elected; Treasurer, George J. Keller, re-elected; Librarian, Louis Doerfel; Curator: Lepidoptera, Charles Rommel, Coleoptera and other orders, Ed. Bischoff, re-elected; trustee for three years, R. Schleckser; trustee for one year, John Angelman.

Mr. Harry Weiss, of New Brunswick, was elected a member.

FREDERICK LEMMER, *Secretary.*

Charles W. Hooker, Ph.D.

CHARLES W. HOOKER, PH.D., entomologist to the Federal Experiment Station and plant inspector of the Port of Mayaguez, Porto Rico, died on February 12, at the age of thirty, following an attack of appendicitis. Dr. Hooker, who was a graduate of Amherst College in the Class of 1906, received his doctor's degree in Entomology at the Massachusetts Agricultural College in 1909.—*Science*, March 7, 1913.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Wanted for Cash or good exchange, all American live pupae and cocoons, and 100 or more North American Parnassius in paper not expanded. Give nice exotic Lepidoptera and nice large Coleoptera.—Communicate with Monsieur Frank Sever, 333 E. 49th St., N. Y. City.

Lepidoptera—Specimens of diurnals from this section in exchange for other N. A. species new to my collection.—R. A. Leussler, 1137 S. 31st St., Omaha, Neb.

Perfect, fresh mounted specimens of Nocturnal Lepidoptera (both Macro- and Micro-) from this locality offered for exchange.—Fred Marloff, Box 104, Oak Station P. O., Allegheny Co., Pa.

Wanted to buy, sell and exchange insects for demonstration and class work in economic entomology and bulletins and reports from U. S. Dept. Agric. and Agr. Exper. Stations on all subjects.—R. W. Brancher, Kent, Ohio.

Catocalae—*C. desdemona*, **beutenmulleri*, *ilia* var. sp., *aholibah*, *coloradensis*, *pura*, *faustina* and several varieties, *irene* and varieties, *aspasia* var. sp., **zillah*, **lydia*, *verecunda*, *edwardsi*—only a few left of the species marked *.—Tom Spalding, R. F. D. 208z, Provo, Utah.

For Exchange—A few extra entomological publications. Want Ditmar's Reptile Book, biological material, etc.—Fred. S. Carr, 163 Margueretta St , Toronto, Ontario.

Attacus atlas—Largest moth in the world. Fresh bred specimens just received from Philippine Islands, with date and locality, for sale or exchange.—A. F. Porter, Decorah, Ia.

T. Fukai, Konosu, Saitama, Japan, will send Japanese and Formosan insects, especially Lepidoptera and living cocoons. Exchange solicited.

Wanted Parnassiinae from Alaska and West Coast America in exchange for those of all European and Asian localities; particularly Thian Shan and high altitude, Himalaya Mts.—J. Henry Watson, 70 Ashford Road, Withington, Manchester, England.

Hesperidae—I offer in exchange the following species of *Pamphila* for N. A. Lepidoptera not in my collection. *Pamphila aaronii*, *metea*, *panoquin*, *fusca*, *leonardus*, *massasoit*, *phylaeus*, *brettus* and *pontiac*.—Philip Laurent, 31 East Mt. Airy Ave., Philadelphia, Penna.

Acronyctas wanted from all over the Continent, particularly *populi*, *lepusculina* and their allies. Also *Autographas*, especially *octoscripta*, *alias*, *vaccinii* and allies. Cash or exchange in Noctuidae given.—F. H. Wolley Dod, Midnapore, Alta, Canada.

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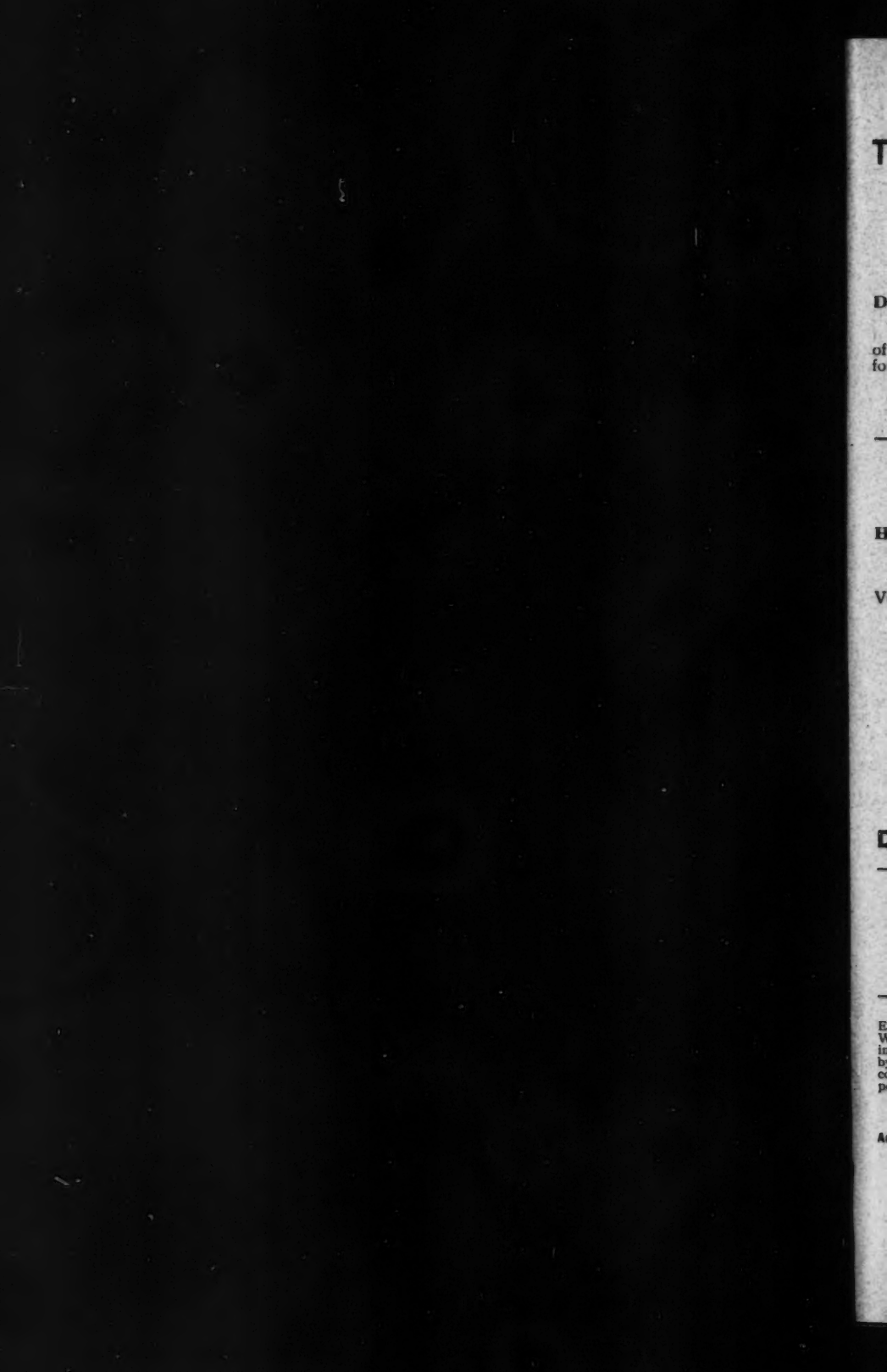

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